STRATIGRAPHIC SUCCESSION IN MICHIGAN

PALEOZOIC THROUGH RECENT

MICHIGAN DEPARTMENT OF CONSERVATION

Ralph A. MacMullan, Director

GEOLOGICAL SURVEY

Gerald E. Eddy, State Geologist

ACKNOWLEDGEMENT: Compiled with the counsel of colleagues in this department, the U. S. Geological Survey, Michigan's universities, other state Geological Surveys, and geologists within Michigan's oil and gas industry. Dr. Aureal T. Cross, Department of Geology, Michigan State University, identified rocks of Mesozoic age and suggested provisional age assignments.

GEOLOGIC NAMES COMMITTEE

Garland D. Ells, Chairman; Robert W. Kelley, Secretary;
Harry J. Hardenberg, L. David Johnson, Harry O. Sorensen

PLEISTOCENE NOMENCLATURE

ERA	SYSTEM	SERIES	STAGE	
CENOZOIC	QUATERNARY	RECENT		
		PLEISTOCENE	Wisconsin Glaciation	Valders Stade
				Two Creeks Interstade
				Mankato Stade (Pt. Huron?)
				Cary Stade
				Tazewell Stade
			Sangamon Interglaciation	
			Illinoian Glaciation	

OUTCROP NOMENCLATURE

GEOLOGIC TIME: ERA	PERIOD	EPOCH	TIME-STRATIGRAPHIC: SYSTEM	SERIES	ROCK-STRATIGRAPHIC: GROUP	FORMATION	MEMBER
MESOZOIC	JURASSIC	LATE	JURASSIC	KIMERIDGIAN			
PALEOZOIC	PENNSYLVANIAN	LATE	PENNSYLVANIAN	CONEMAUGH		Grand River Fm.	Ionia, Eaton, and Woodville Sandstones
		EARLY		POTTSVILLE		Saginaw Fm.	Verne Ls.
	MISSISSIPPIAN	LATE	MISSISSIPPIAN	MERAMECIAN	GRAND RAPIDS	Bayport Ls.	
						Michigan Fm.	
		EARLY		OSAGIAN		Marshall Ss.	Napoleon Ss.
				KINDERHOOKIAN		Coldwater Sh.	
	MISSISSIPPIAN-DEVONIAN Unassigned						
	DEVONIAN	LATE	DEVONIAN			Ellsworth Sh. (Western Michigan)	
				CHAUTAUQUAN		Antrim Sh.	
				SENECAN	TRAVERSE	Squaw Bay Ls.	
		MIDDLE		ERIAN		Thunder Bay Ls.	
						Potter Farm Fm.	
						Norway Point Fm.	
						Four Mile Dam Fm.	
						Alpena Ls.	
						Newton Creek Ls.	
						Genshaw Fm.	Killians
						Ferron Point Fm.	
						Rockport Quarry Ls.	
						Bell Sh.	
						Rogers City Ls.	
						Dundee Ls.	
				ULSTERIAN	DETROIT RIVER	Anderdon Fm.	
						Lucas Fm.	
						Amherstburg Fm.	
						Sylvania Ss.	
						Bois Blanc Fm.	
		EARLY				Garden Island Fm.	
	SILURIAN	LATE	SILURIAN	CAYUGAN	BASS ISLANDS	Raisin River Dol.	
						Put-in-Bay Dol.	
					SALINA	St. Ignace Dol. (Northern Peninsula)	
						Pte. aux Chenes Sh.	
		MIDDLE		NIAGARAN		Engadine Dol.	
					MANISTIQUE	Cordell Dol.	
						Schoolcraft Dol.	
					BURNT BLUFF	Hendricks Dol.	Fiborn Ls.
						Byron Dol.	
						Lime Island Dol.	
		EARLY		ALEXANDRIAN	CATARACT	Cabot Head Sh.	
						Manitoulin Dol.	
	ORDOVICIAN	LATE	ORDOVICIAN	CINCINNATIAN	RICHMOND	Big Hill Fm.	
						Stonington Fm.	Ogontz
							Bay de Noc
						Bill's Creek Sh.	
							Collingwood
		MIDDLE		MOHAWKIAN	TRENTON	Groos Quarry Fm.	
						Chandler Falls Fm.	
					BLACK RIVER	Bony Falls Fm.	
		EARLY		CHAZYAN			
				CANADIAN	PRAIRIE DU CHIEN	Oneota Dol.	
	CAMBRIAN	LATE	CAMBRIAN	ST. CROIXAN	LAKE SUPERIOR	Trempealeau Fm.	Jordan Ss.
							Lodi
							St. Lawrence
						Munising Fm.	Miner's Castle Ss.
							Chapel Rock Ss.
		MIDDLE				Jacobsville Ss.	
		EARLY					
PRECAMBRIAN							

SUBSURFACE NOMENCLATURE

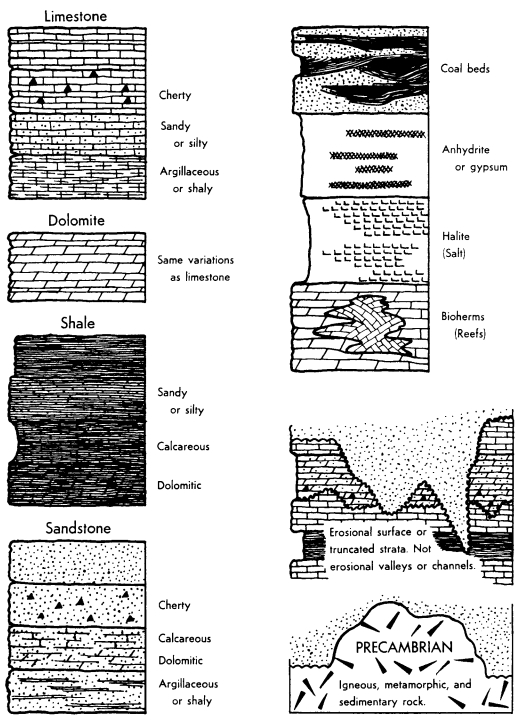
ROCK-STRATIGRAPHIC: FORMATION	MEMBER	GROUP	Approximate maximum thickness, in feet, of rock units in the subsurface. NO SCALE
Glacial Drift			
Subsurface only (?)			220
"Red Beds" (unnamed)			
Grand River Fm.			750
Saginaw Fm.			
Bayport Ls.		GRAND RAPIDS	160
Michigan Fm.			600
Marshall Ss.	Napoleon Ss.		330
Coldwater Sh.			1300
Sunbury Sh.		(Eastern Michigan)	160
Ellsworth Sh.	Berea Ss.		260
	Bedford Sh.		240
Antrim Sh.			660
Squaw Bay Ls.		TRAVERSE	830
Alpena Ls.			
Generally undivided in subsurface.			
Bell Sh.			
Rogers City Ls.			475
Dundee Ls.			
Lucas Fm.		DETROIT RIVER	1450
Amherstburg Fm.			
Sylvania Ss.			
Bois Blanc Fm.			800
Garden Island Fm.			100
Bass Islands		BASS ISLANDS	700
G Unit		SALINA	3150
F Evaporites			
E Unit			
D Evaporite			
C Unit			
B Evaporite			
A-2 Carbonate			
A-2 Evaporite			
A-1 Carbonate			
A-1 Evaporite			
Generally undivided in subsurface.		NIAGARA	980
Cabot Head Sh.		CATARACT	200?
Manitoulin Dol.			
Queenston Sh.		RICHMOND	950
Utica Sh.	Collingwood		
Generally undivided in subsurface.		TRENTON	1100
	Glenwood	BLACK RIVER	
St. Peter Ss.			260
Shakopee Dol.		PRAIRIE DU CHIEN	425
New Richmond Ss.			
Oneota Dol.			
Trempealeau Fm.	Jordan Ss.	LAKE SUPERIOR	750
	Lodi		
	St. Lawrence		
Munising Fm.	Franconia Ss.		1175?
	Dresbach Ss.		
	Eau Claire		
	Mount Simon Ss.		
Jacobsville Ss.			1100+
PRECAMBRIAN			

INFORMAL TERMS

Principal oil and gas pays, and informal terms used in petroleum exploration and applied to parts of formations or groups in the subsurface.

STRATIGRAPHIC POSITION	INFORMAL TERMS	PAYS
Basal sandstones of Saginaw Fm.	Parma sandstone	
In lower part of Michigan	triple gyp.	
	brown lime	
	stray-stray ss.	Gas
	stray dol.	
	stray ss.	Gas & Oil
Marshall Ss.		Gas & Oil
Coldwater Sh.	Coldwater lime	
	Weir sand	Gas
	Coldwater red-rock	
In upper part of Ellsworth Sh.	"Berea" (Western Michigan)	Oil & Gas
Berea Ss.	Berea sand (Eastern Michigan)	Oil & Gas
Squaw Bay Ls.	Squaw Bay	Oil & Gas
Upper part of Traverse Group in Western Michigan	Traverse formation	
	Traverse lime	Oil & Gas
	Stoney Lake zone	Oil & Gas
Rogers City Ls.		Oil & Gas
Dundee Ls.		Oil & Gas
Dundee Ls. (?), Upper part of Lucas Fm. (?)	Reed City zone	Oil & Gas
In Lucas Fm.	massive salt	
	big salt	
	sour zone	Oil & Gas
	massive anhydrite	
	big anhydrite	
	Richfield zone	Oil & Gas
Amherstburg Fm.	black lime	
Part of Salina Group E Unit	E zone (or Kintigh zone)	Oil
Divisions of A-2 Carbonate in Western Michigan	A-2 dolomite	Gas
	A-2 lime	
A-1 Carbonate	A-1 dolomite	Oil & Gas
Upper part of Niagaran Series	brown Niagaran	Oil & Gas
	gray Niagaran	
	white Niagaran	
Part of Niagaran Series	Clinton shale (Eastern Michigan)	
Trenton Group		Oil & Gas
Black River Group	Black River formation	Oil & Gas
	Black River shale	
	Van Wert zone	
Oneota Dol.		Oil

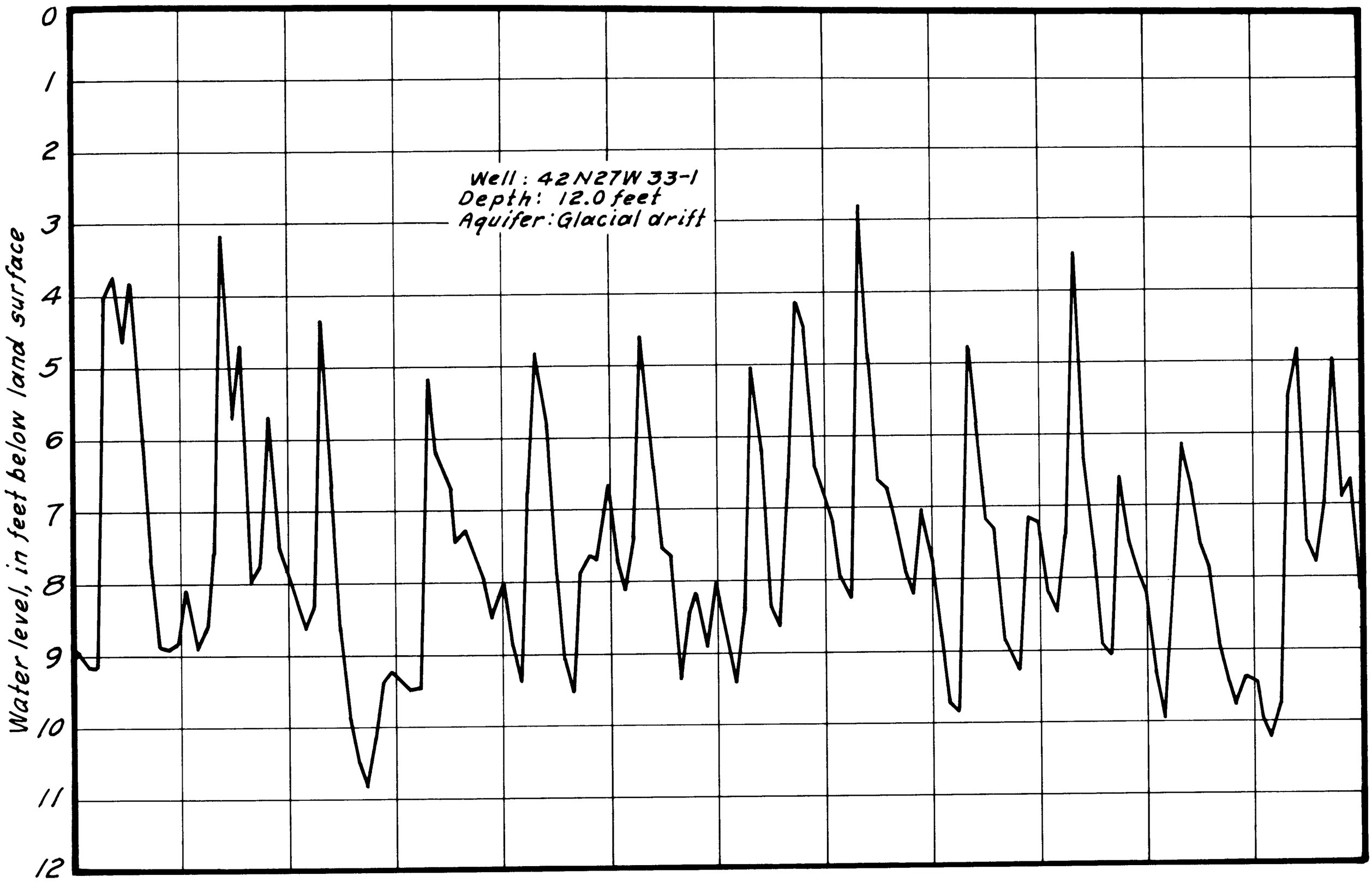
EXPLANATION

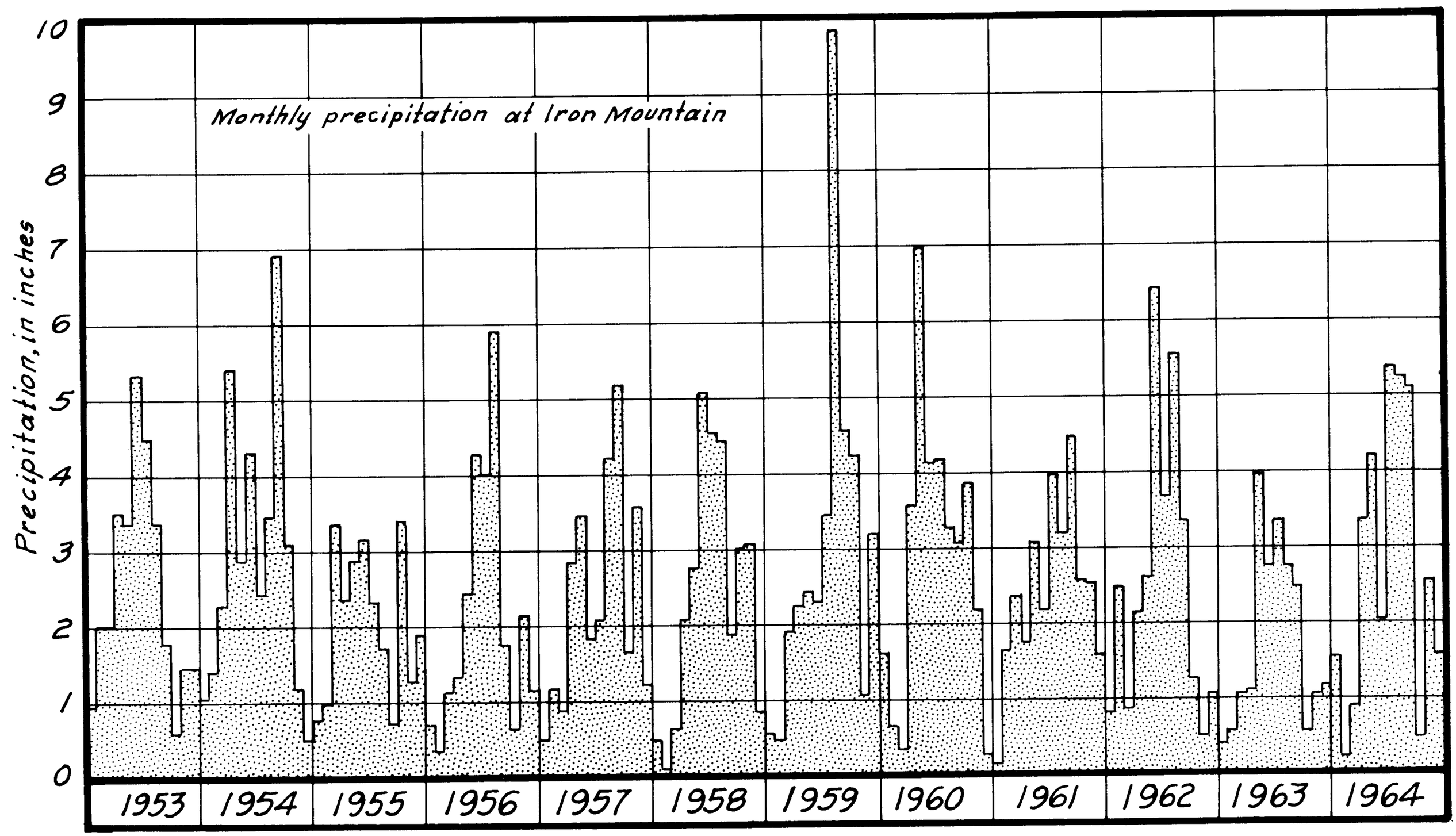


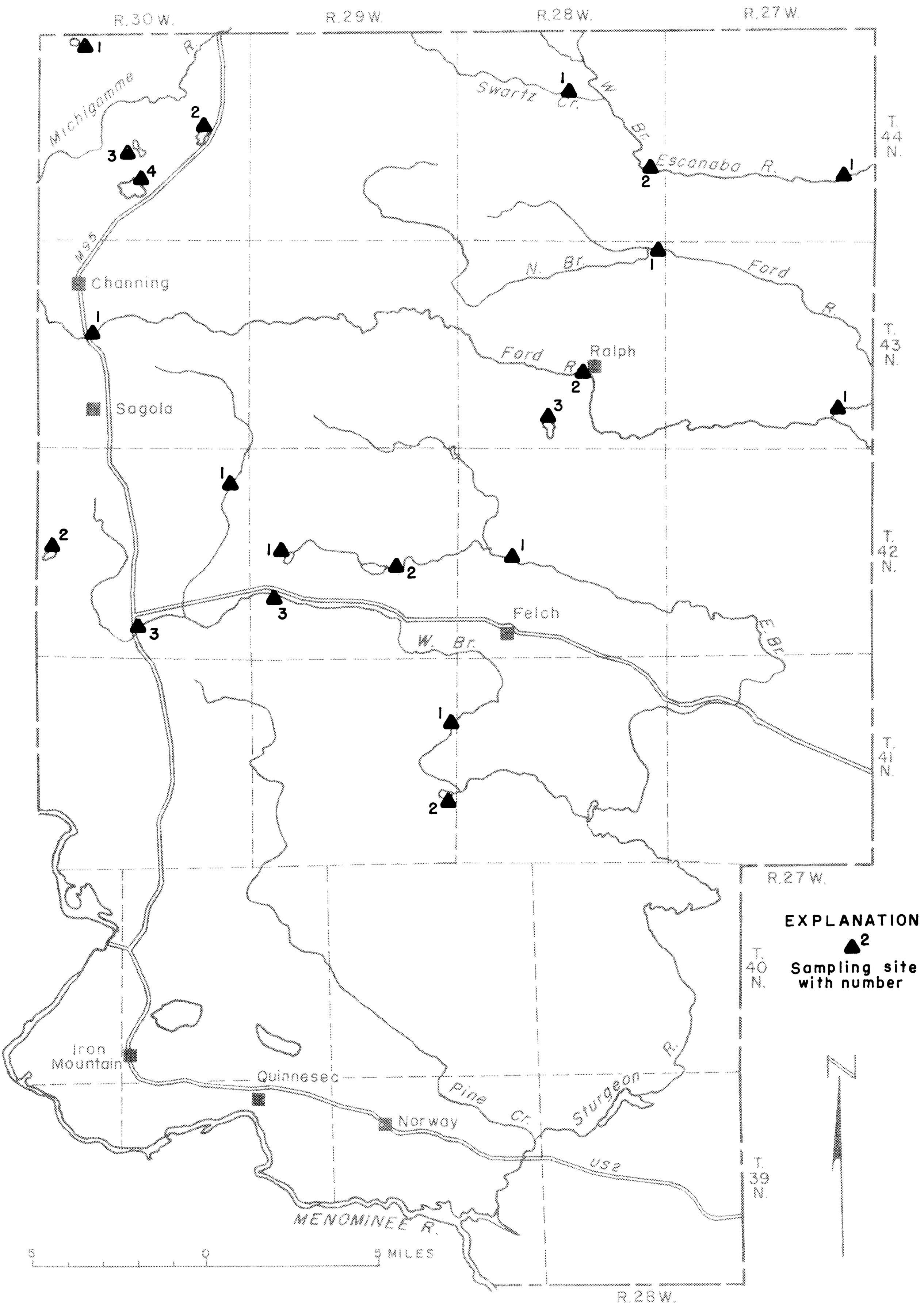
GEOLOGIC NAMES COMPILATIONS: Harry O. Sorensen, Cambrian and Ordovician; Robert W. Kelley, Early and Middle Silurian; Garland D. Ells, Late Silurian through Detroit River Group of Devonian age; Harry J. Hardenberg, Dundee Limestone through Traverse Group of Devonian age; L. David Johnson, Antrim Shale through the Pennsylvanian System; F. Wells Terwilliger, glacial geology of the Cenozoic.

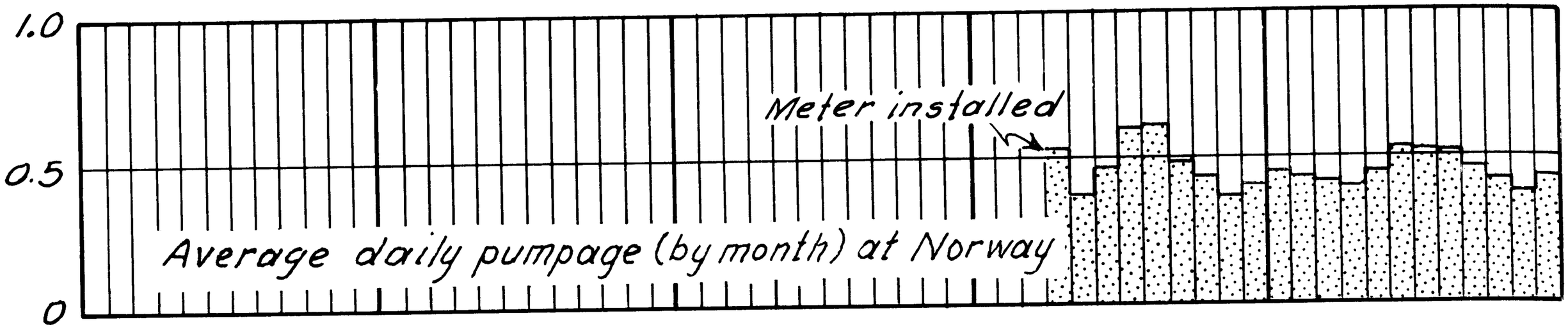
CHART 1

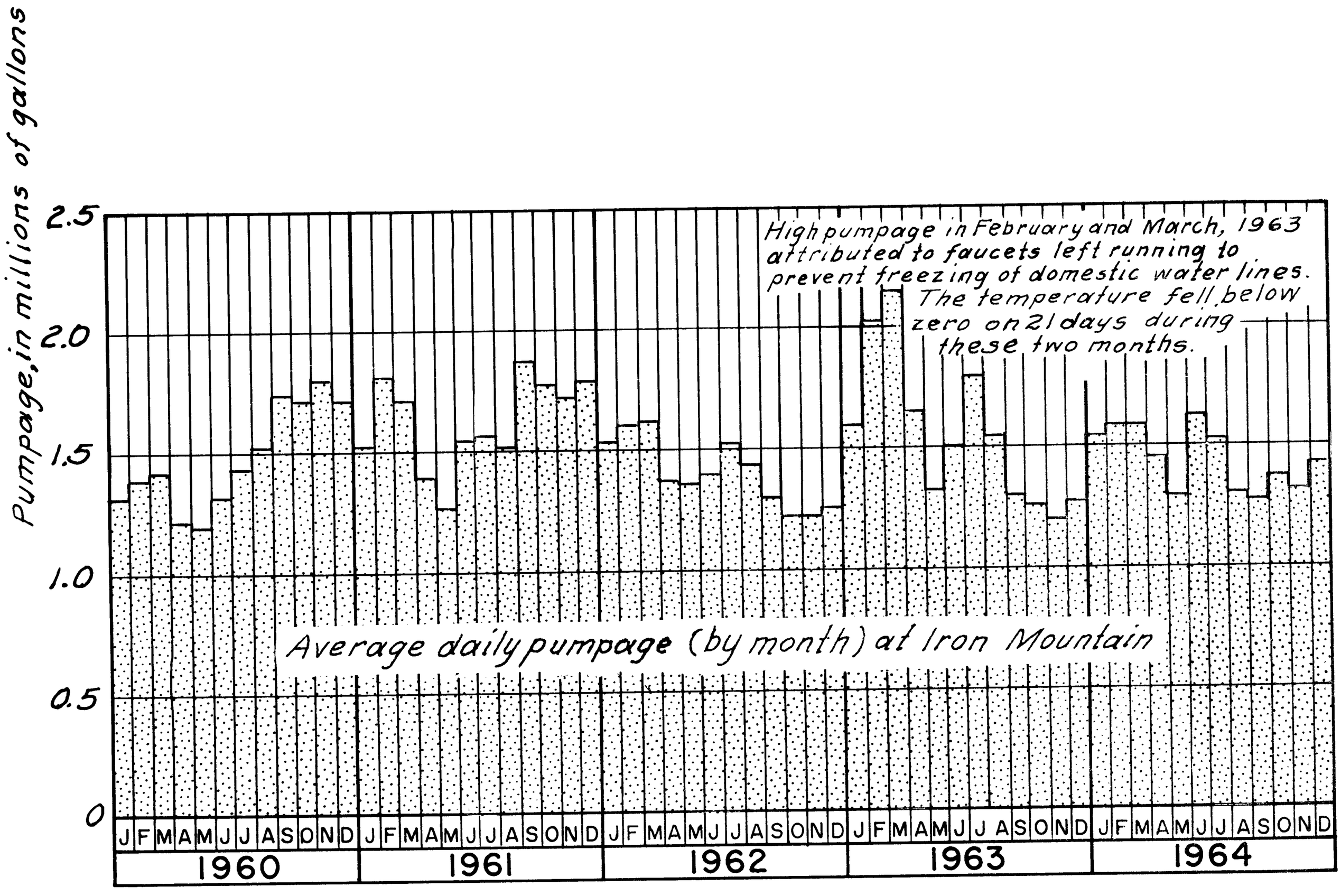
1964

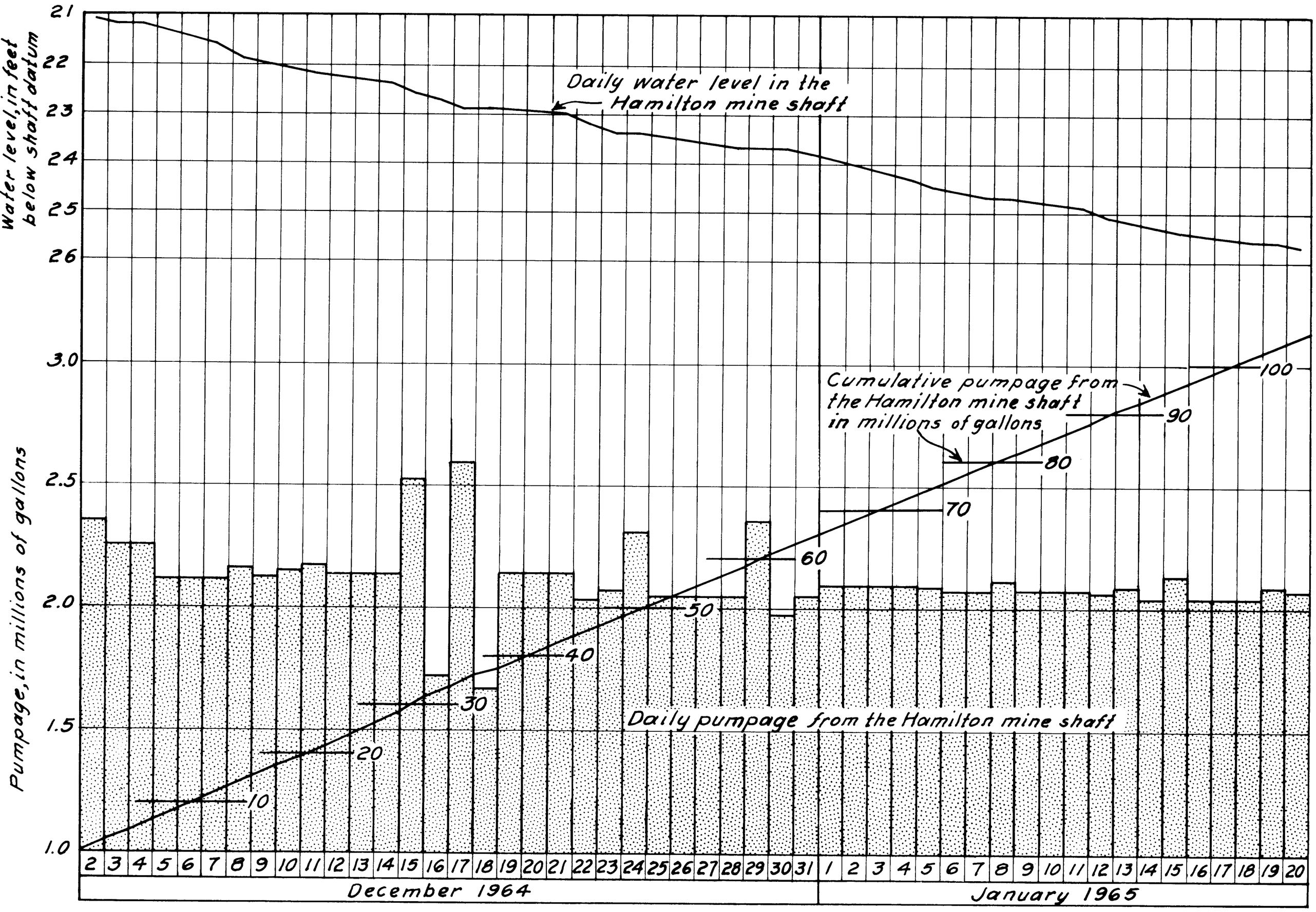

Well: 42N27W 33-1
Depth: 12.0 feet
Aquifer: Glacial drift
Water level, in feet below land surface
0
1
2
3
4
5
6
7
8
9
10
11
12

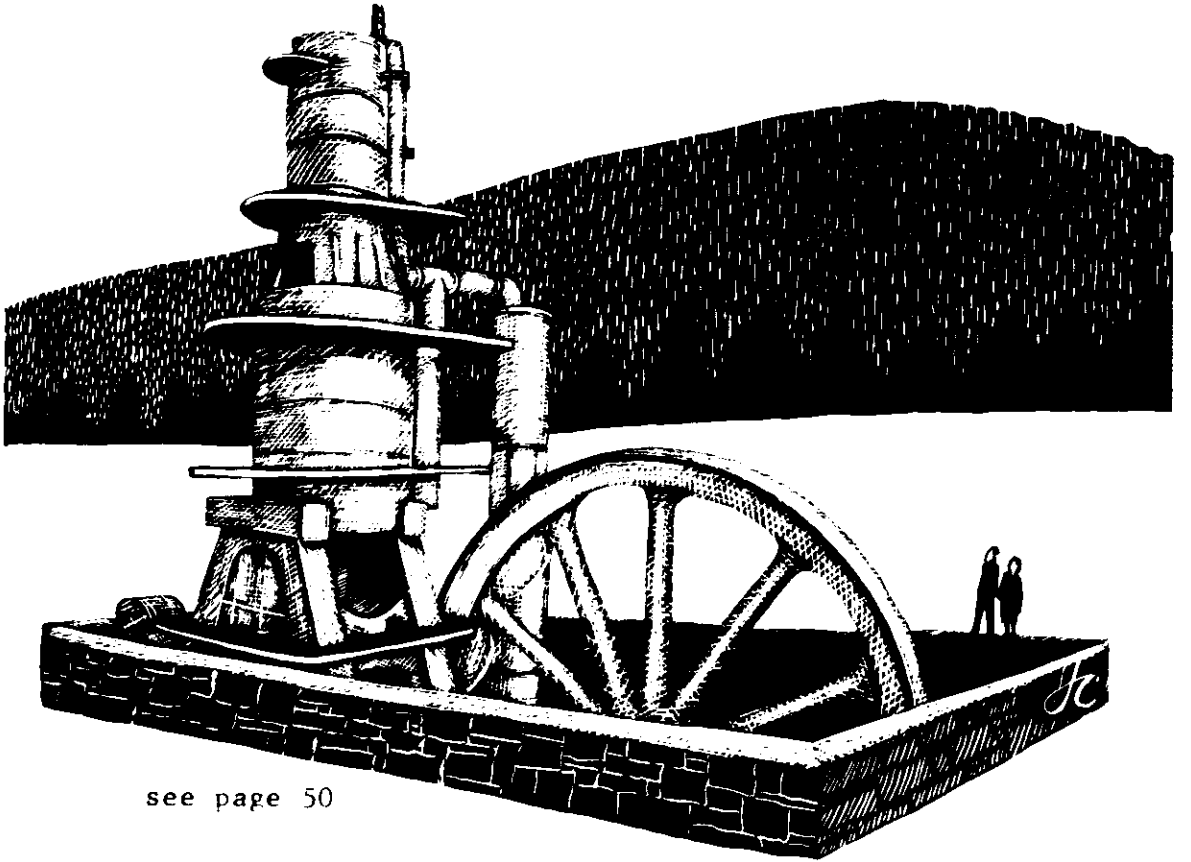

Monthly precipitation at Iron Mountain
Precipitation, in inches
10
9
8
7
6
5
4
3
2
1
0
1953
1954
1955
1956
1957
1958
1959
1960
1961
1962
1963
1964


R.30W.
R.29W.
R.28W.
R.27W.
T. 44 N.
T. 43 N.
T. 42 N.
T. 41 N.
T. 40 N.
T. 39 N.
Michigamme
R.
Swartz Cr.
W. Br.
Escanaba R.
M.95
Channing
N. Br.
Ford
R.
Ralph
Sagola
Felch
W. Br.
E. Br.
Iron Mountain
Quinnesec
Norway
Pine Cr.
Sturgeon
R.
US 2
MENOMINEE R.
5 0 5 MILES
EXPLANATION
Sampling site with number
N

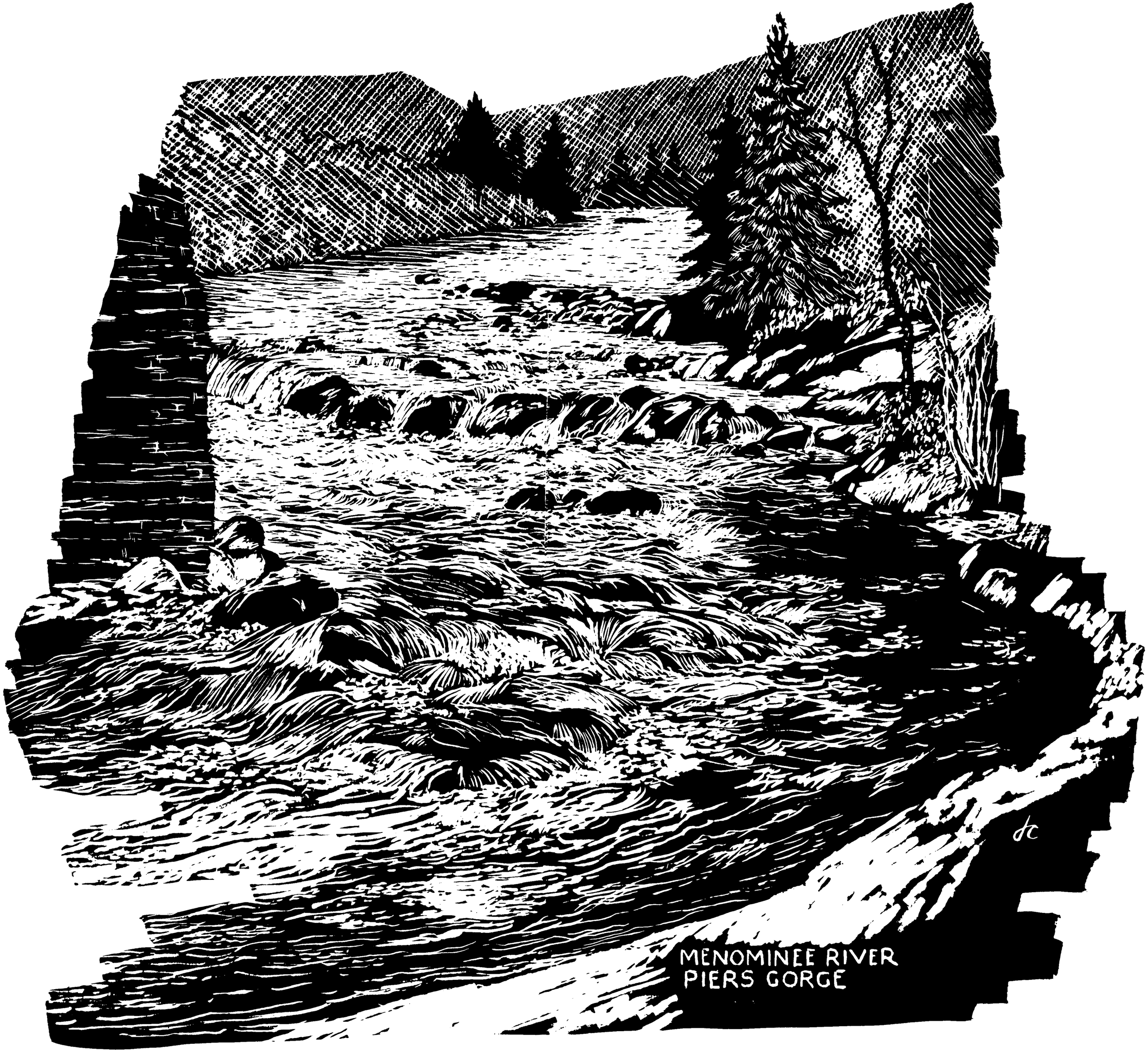

1.0
0.5
0
Meter installed
Average daily pumpage (by month) at Norway

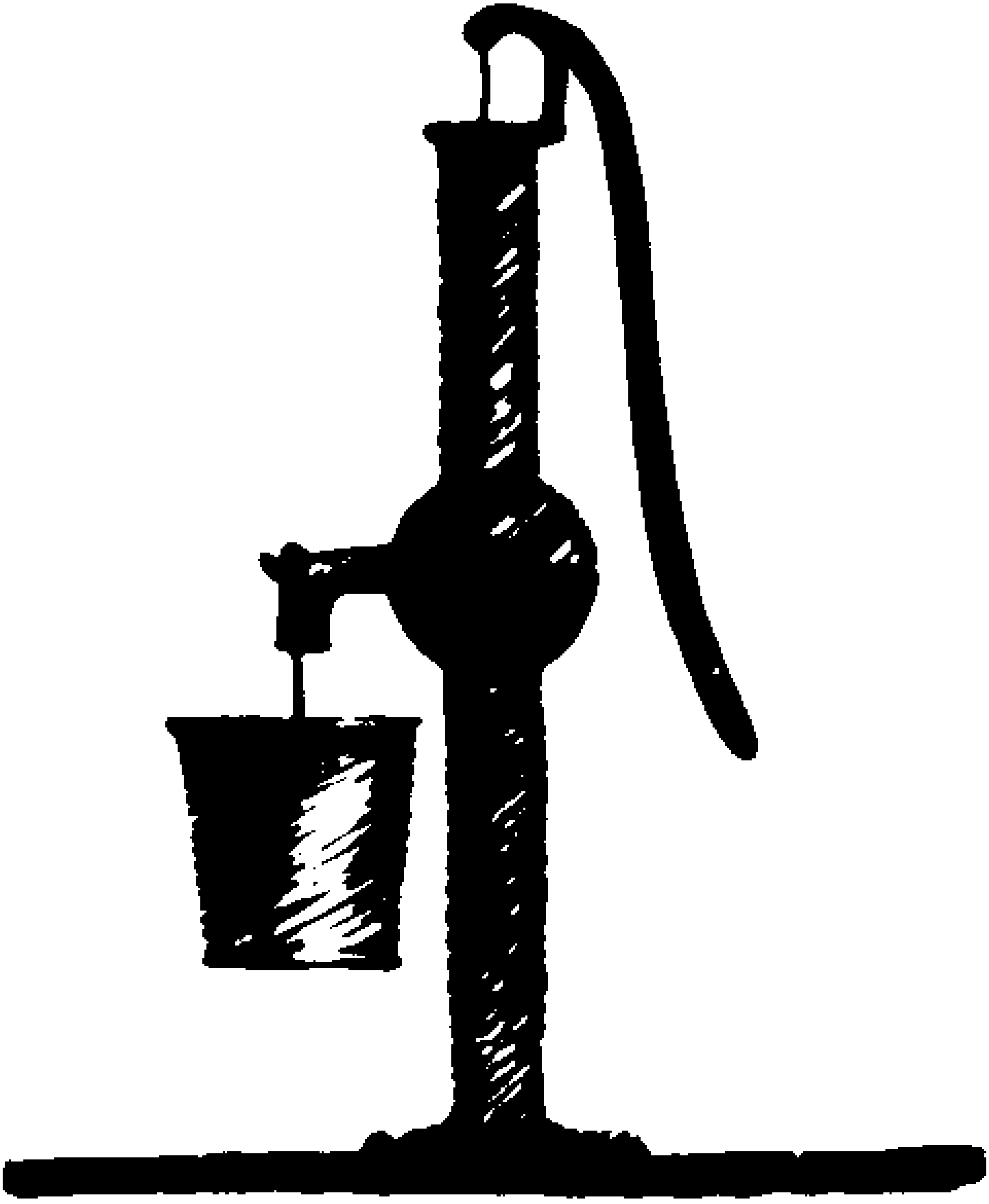

Pumpage, in millions of gallons
2.5
2.0
1.5
1.0
0.5
0
High pumpage in February and March, 1963 attributed to faucets left running to prevent freezing of domestic water lines.
The temperature fell below zero on 21 days during these two months.
Average daily pumpage (by month) at Iron Mountain
J F M A M J J A S O N D
1960
1961
1962
1963
1964

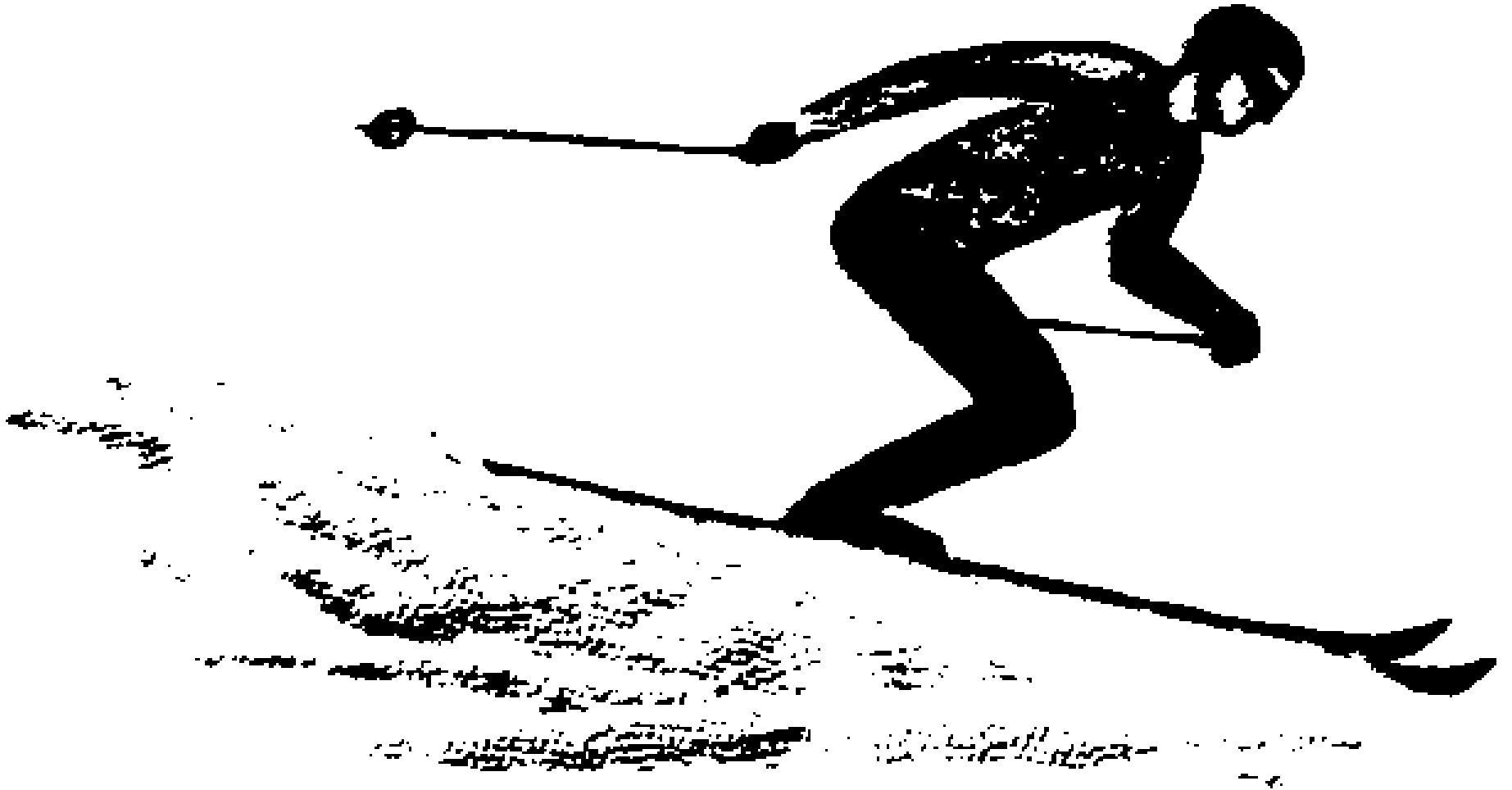

Water level, in feet below shaft datum
21
22
23
24
25
26
Daily water level in the Hamilton mine shaft
Pumpage, in millions of gallons
3.0
2.5
2.0
1.5
1.0
Cumulative pumpage from the Hamilton mine shaft in millions of gallons
10
20
30
40
50
60
70
80
90
100
Daily pumpage from the Hamilton mine shaft
2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
December 1964
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
January 1965

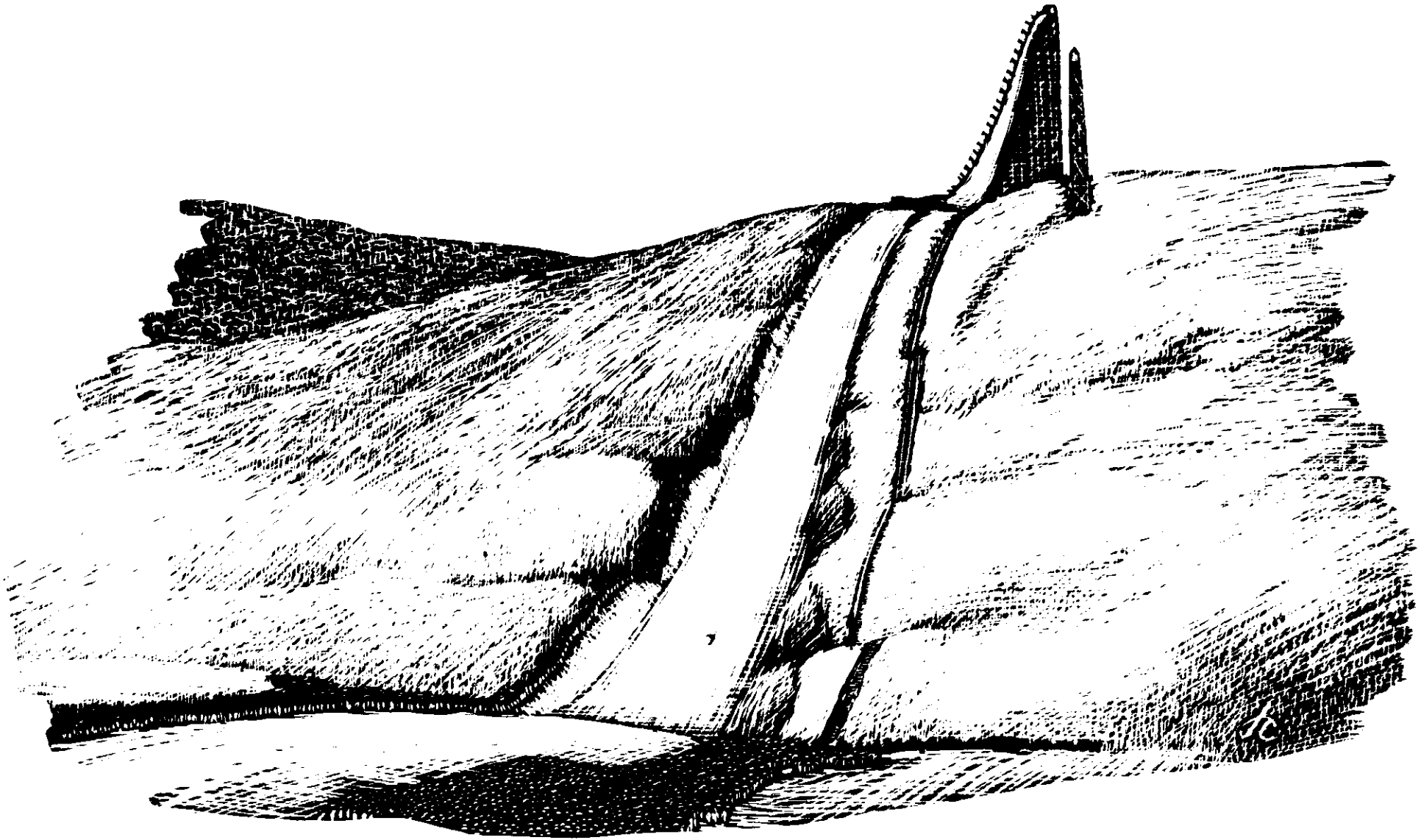


see page 50

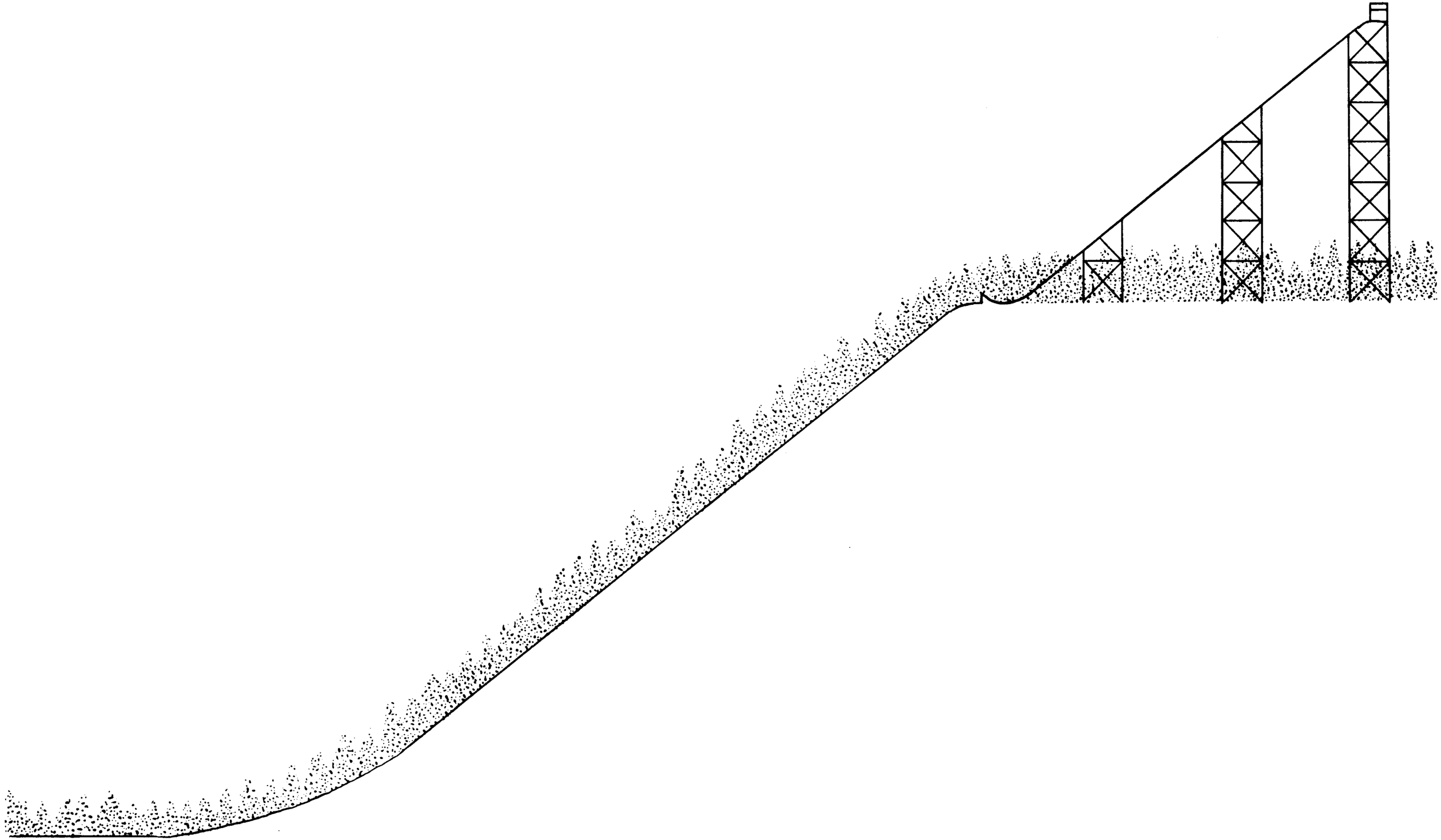

MENOMINEE RIVER
PIERS GORGE
dc

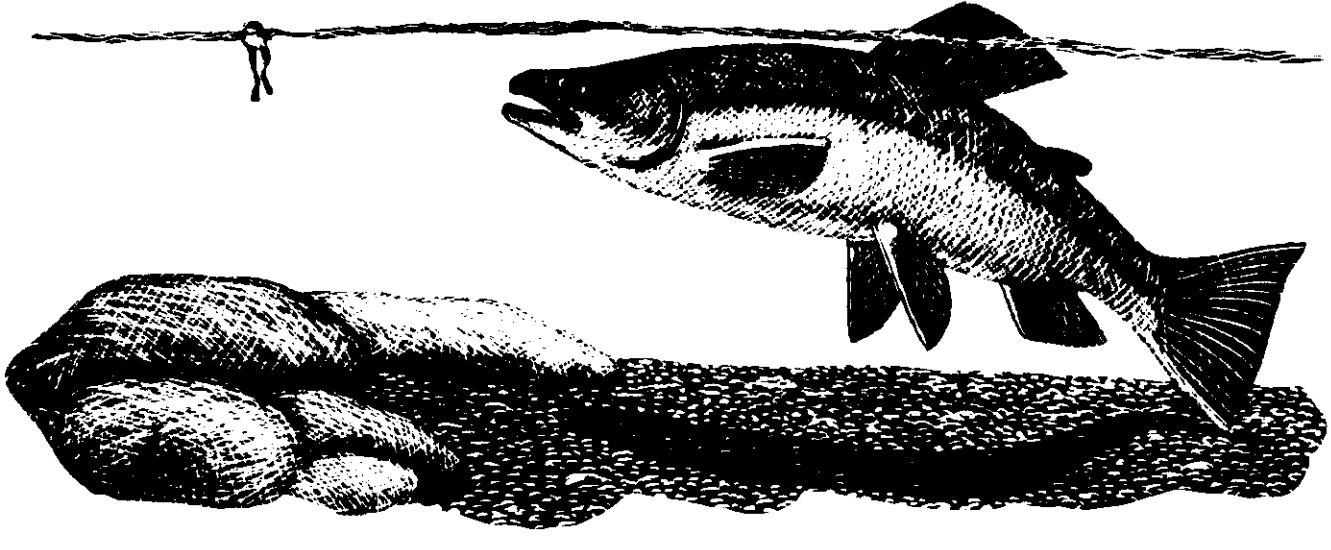


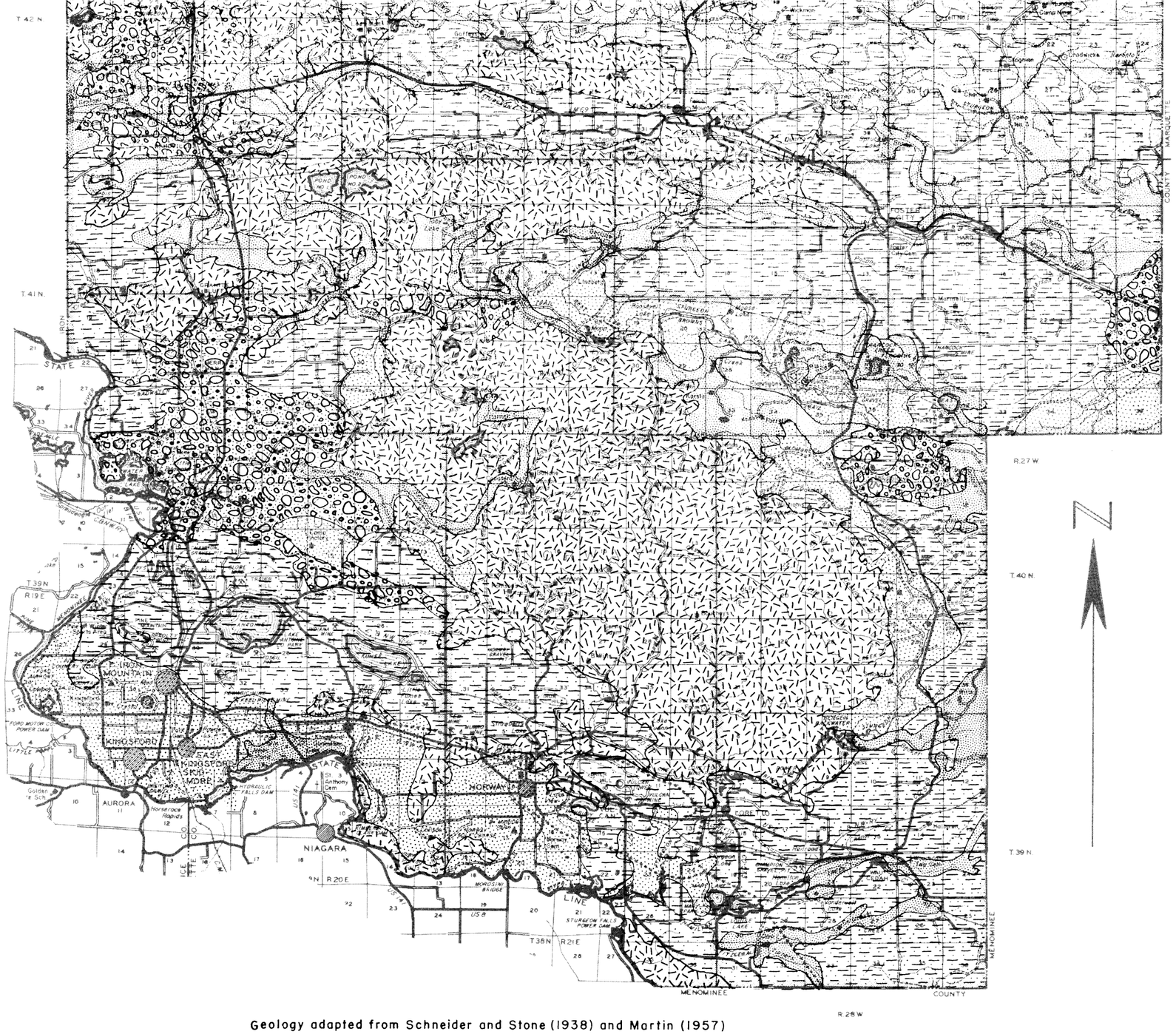




Pine Mountain Ski Jump, Iron Mountain







Geology adapted from Schneider and Stone (1938) and Martin (1957)

Only a few wells will yield more than 10 gpm. Most but not the small-diameter wells will yield enough water for domestic purposes. Dug wells are more successful because of large infiltration area and storage capacity. Many wells will fail because of impermeable drift or bedrock at shallow depth.

Swamp deposits

Large-diameter wells penetrating thick deposits of sand and gravel that may occur beneath swamp deposits may yield 100 gpm. Most small-diameter wells will yield enough water for domestic purposes. Some wells may fail because of impermeable till or bedrock at shallow depth.

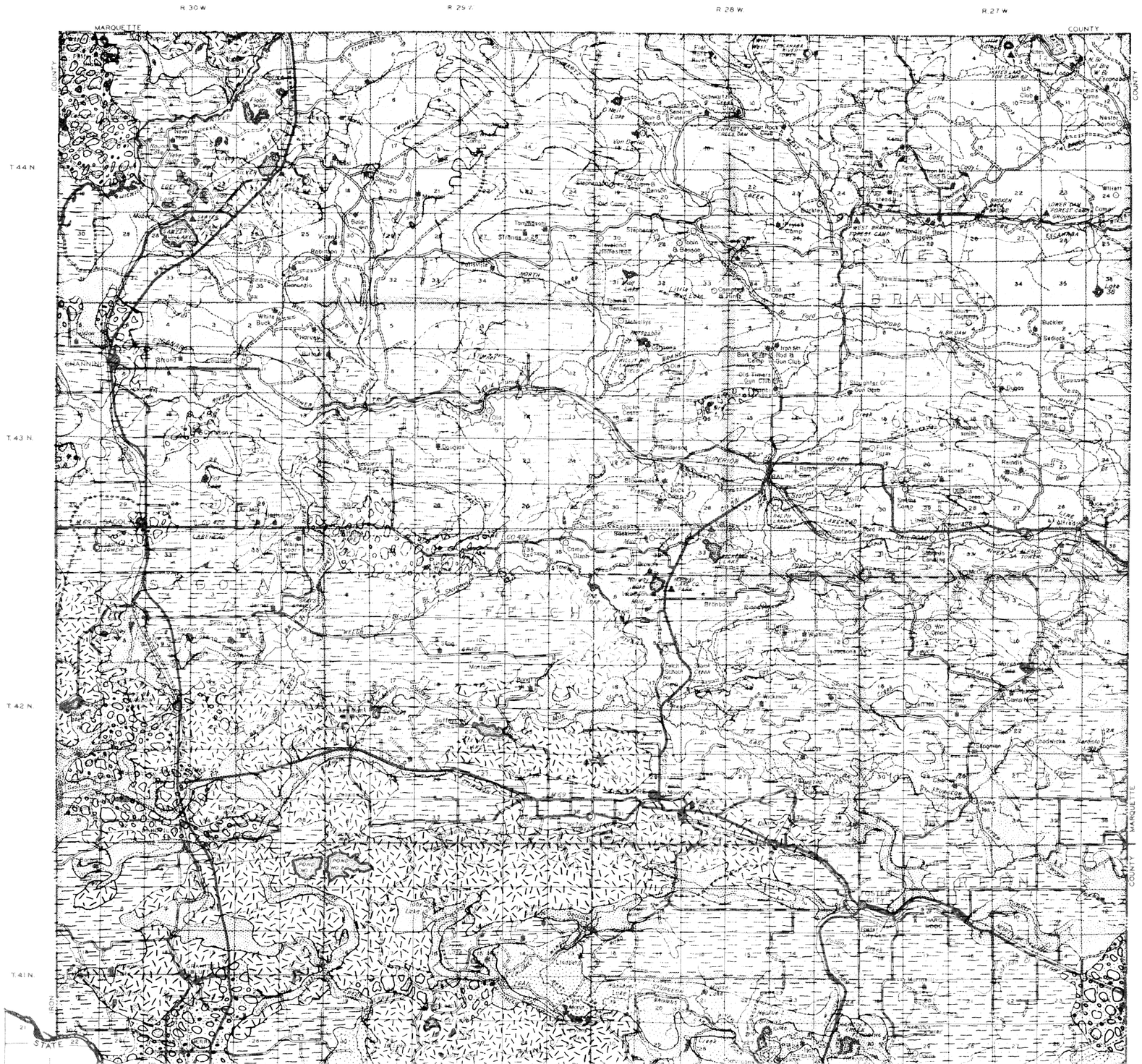
Bedrock areas
Small areas not shown.

Bedrock is usually encountered within a few feet of the surface. A few wells located in valleys may obtain enough water from the shallow drift for domestic purposes, but most will be insufficient for even a hunting camp. Should a well in the drift fail to yield water, possibly a small supply may be obtained by drilling a few feet into the underlying bedrock.

0 1 2 3 4 5 6 Miles

AVAILABILITY OF GROUND WATER FROM GLACIAL DRIFT IN DICKINSON COUNTY, MICHIGAN

MAP 1, WATER INVESTIGATION 5, MICHIGAN GEOLOGICAL SURVEY, 1966



EXPLANATION

Tilt and gravel

Tilt.

Only a few wells will yield more than 10 gpm. About half of the small-diameter wells will yield enough water for domestic purposes. Dug wells are most successful because of large infiltration area and storage capacity. Many wells will fail because of impermeable drift or bedrock at shallow depth.

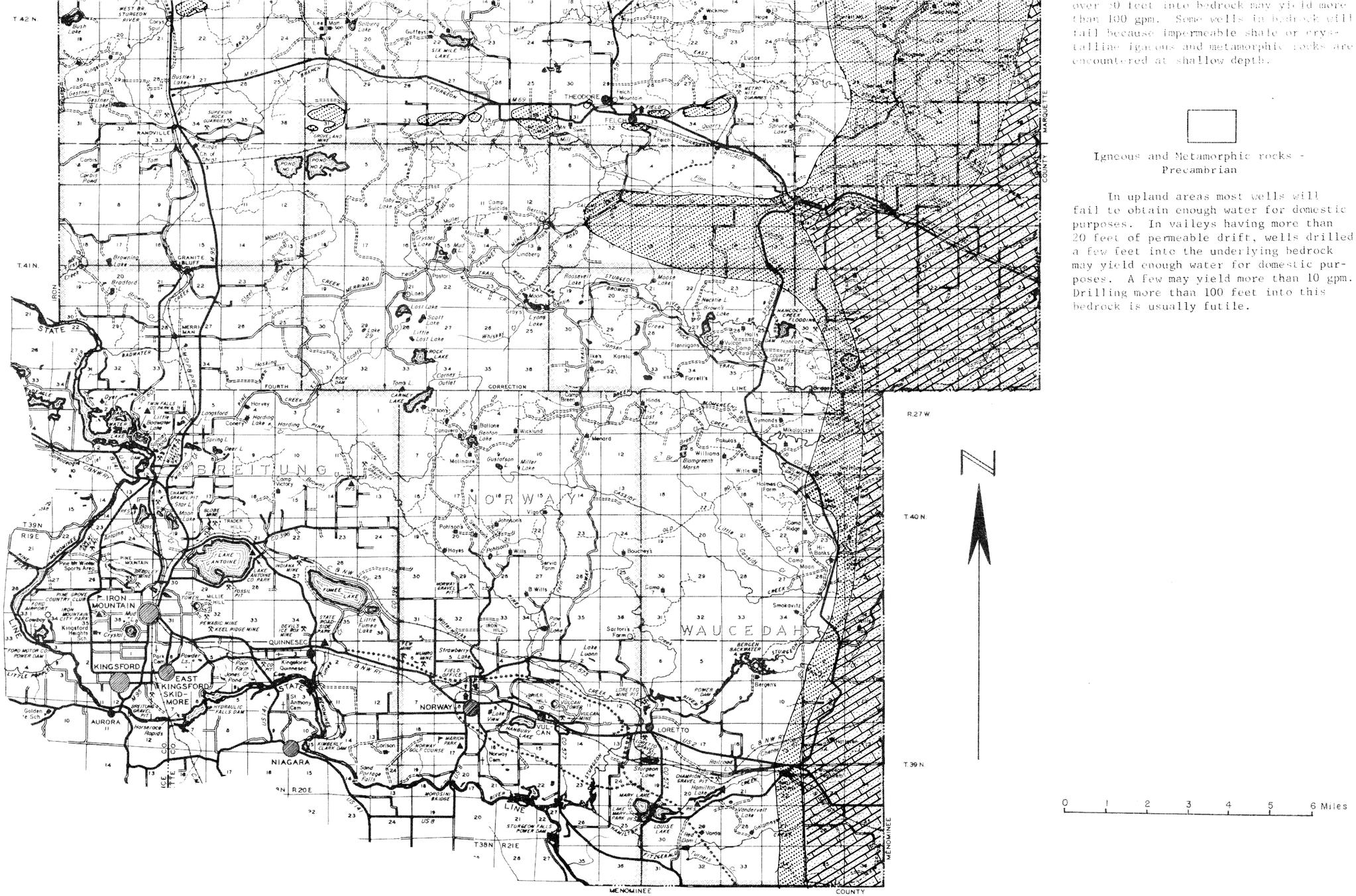
Swamp deposits

Large-diameter wells penetrating thick deposits of sand and gravel that

over 50 feet into bedrock may yield more than 100 gpm. Some wells in bedrock will fail because impermeable shale or crystalline igneous and metamorphic rocks are encountered at shallow depth.

Igneous and Metamorphic rocks - Precambrian

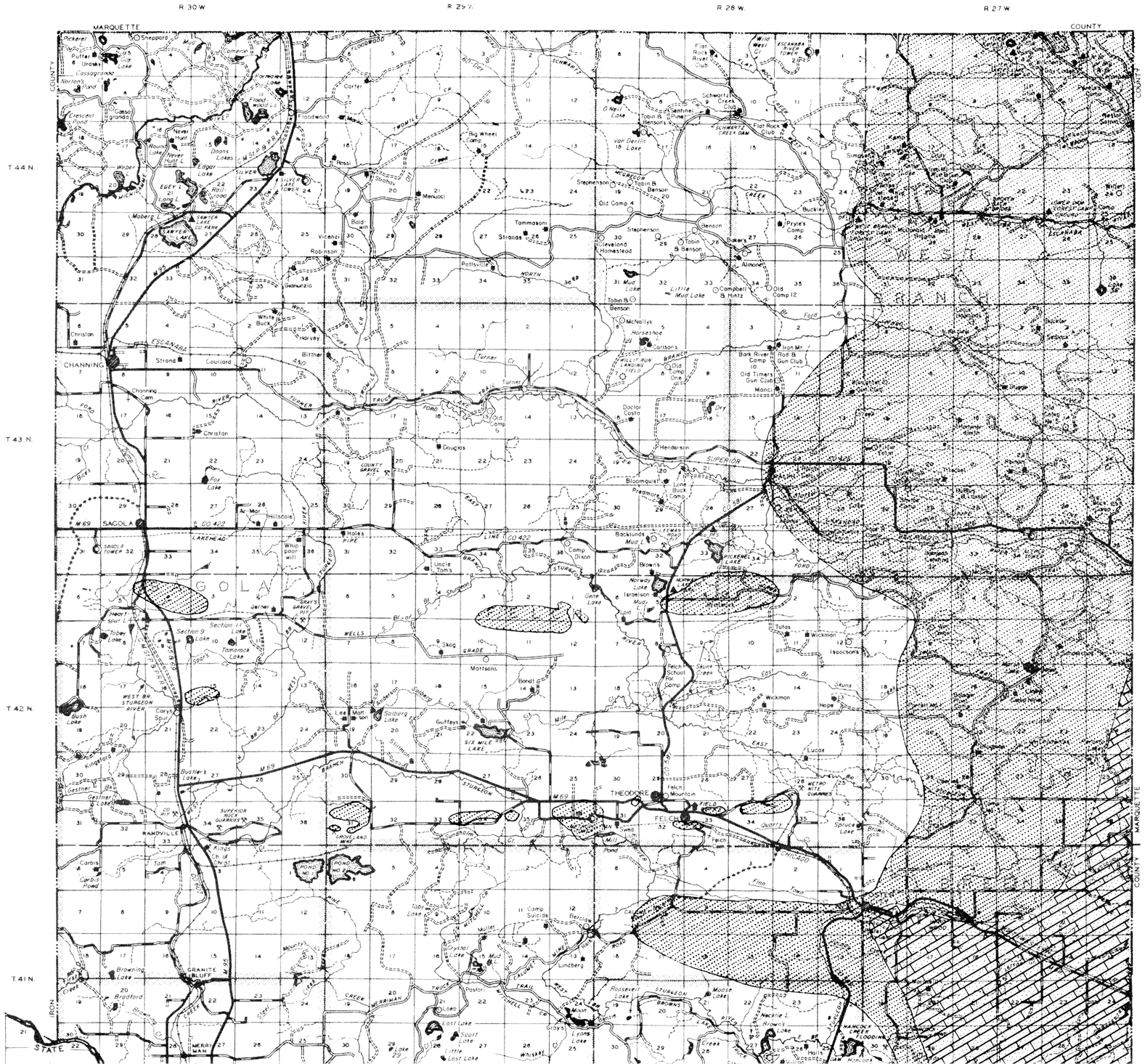
In upland areas most wells will fail to obtain enough water for domestic purposes. In valleys having more than 20 feet of permeable drift, wells drilled a few feet into the underlying bedrock may yield enough water for domestic purposes. A few may yield more than 10 gpm. Drilling more than 100 feet into this bedrock is usually futile.



Geology adapted from Martin (1936) and James (1961)

AVAILABILITY OF GROUND WATER FROM BEDROCK IN DICKINSON COUNTY, MICHIGAN

MAP 2, WATER INVESTIGATION 5, MICHIGAN GEOLOGICAL SURVEY, 1966



EXPLANATION

Dolomites - Cambrian and Ordovician

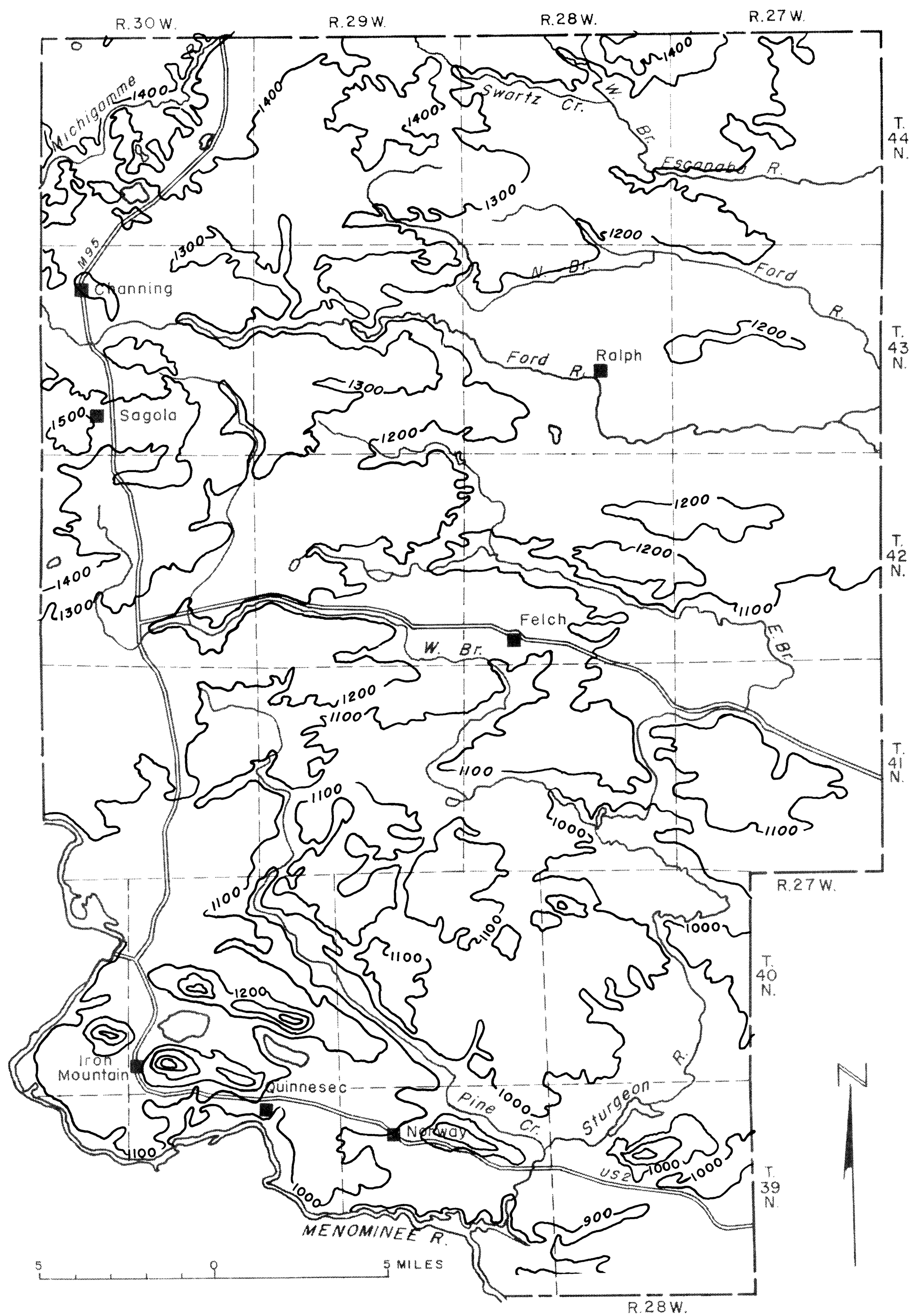
Essentially sandy dolomites and dolomitic sandstones, with some shale. Most wells drilled into this bedrock will yield enough water for domestic purposes. Large-diameter wells drilled over 50 feet into bedrock may yield as much as 50 gpm. If sufficient water is not obtained from these beds, the wells may be deepened to penetrate the underlying sandstones.

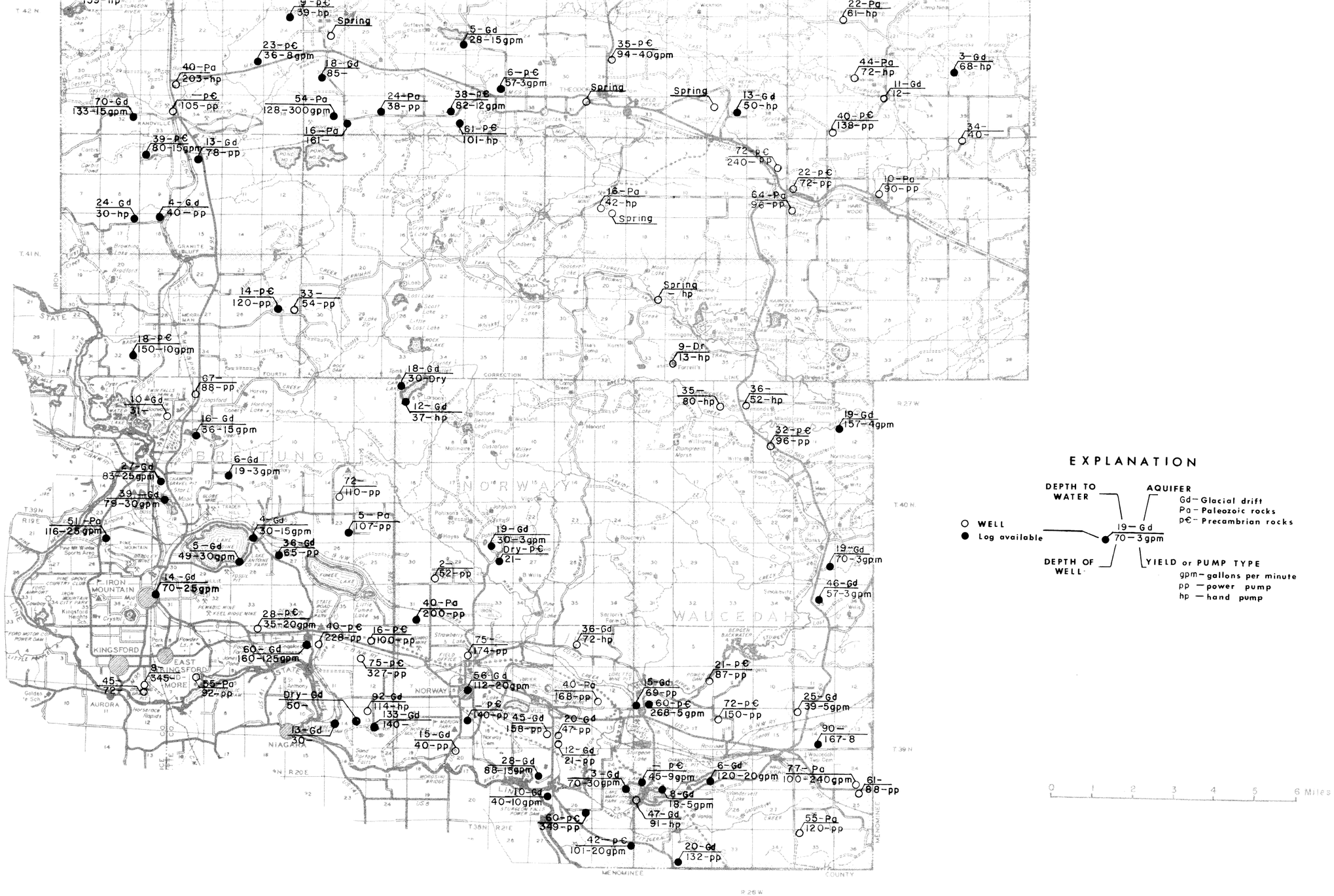
Sandstone - Cambrian

Most wells drilled into this bedrock will yield enough water for domestic purposes. Large-diameter wells drilled over 50 feet into bedrock may yield more than 100 gpm. Some wells in bedrock will fail because impermeable shale or crystalline igneous and metamorphic rocks are encountered at shallow depth.

Igneous and Metamorphic rocks - Precambrian

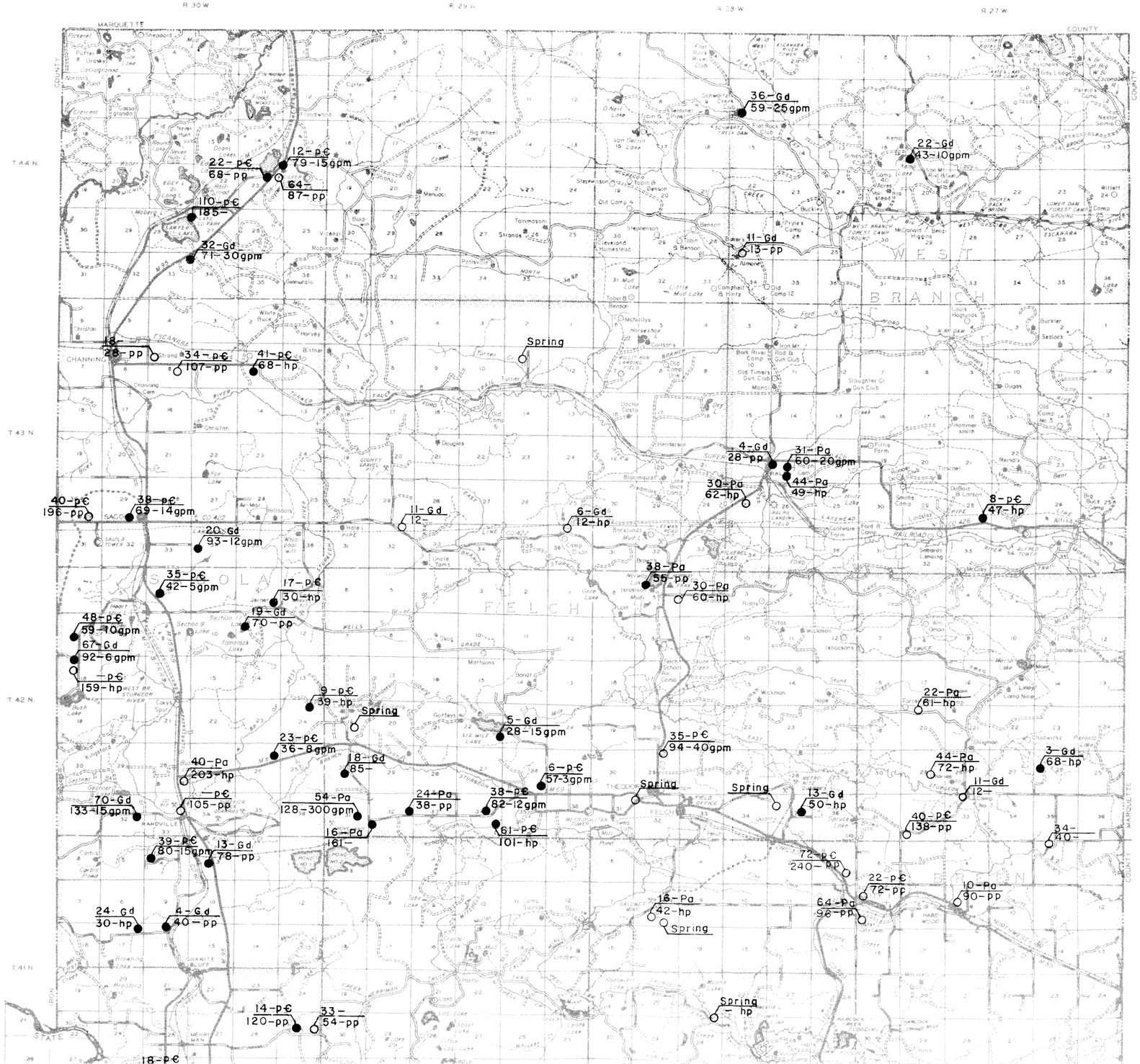
In upland areas most wells will fail to obtain enough water for domestic purposes. In valleys having more than 20 feet of permeable drift, wells drilled a few feet into the underlying bedrock may yield enough water for domestic purposes. A few may yield more than 10 gpm. Drilling more than 100 feet into this bedrock is usually futile.

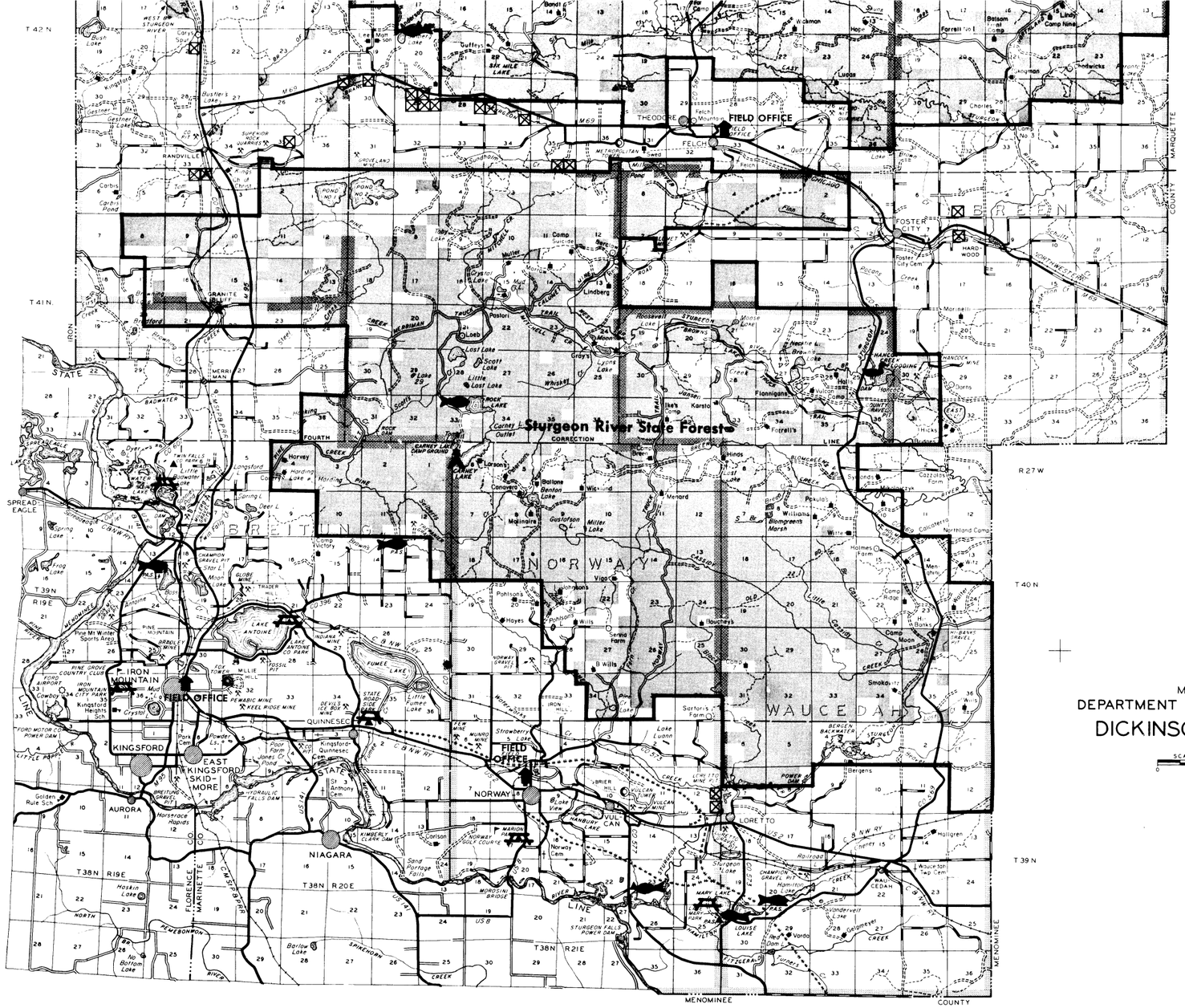

R.30 W.
R.29 W.
R.28 W.
R.27 W.
T. 44 N.
T. 43 N.
T. 42 N.
T. 41 N.
T. 40 N.
T. 39 N.
Michigamme
Swartz Cr.
N. Br.
Escanaba R.
M95
Channing
N. Br.
Ford R.
Ford R.
Ralph
Sagola
Felch
W. Br.
E. Br.
Iron Mountain
Quinnesec
Norway
Pine Cr.
Sturgeon R.
US 2
MENOMINEE R.
5 0 5 MILES
N



HYDROLOGIC DATA OF SELECTED WELLS IN DICKINSON COUNTY, MICHIGAN

MAP 4, WATER INVESTIGATION 5, MICHIGAN GEOLOGICAL SURVEY, 1966


R. 30 W.
R. 29 W.
R. 28 W.
R. 27 W.
T. 44 N.
T. 43 N.
T. 42 N.
T. 41 N.
MARQUETTE
COUNTY
CHANNING
WEST BRANCH
FELCH
SAGOLA
RANDVILLE
GRANITE BLUFF
Spring
36-Gd
59-25gpm
22-Gd
43-10gpm
12-p€
79-15gpm
22-p€
68-pp
64-
87-pp
110-p€
185-
32-Gd
71-30gpm
11-Gd
13-pp
18-
28-pp
34-p€
107-pp
41-p€
68-hp
4-Gd
28-pp
31-Pa
60-20gpm
44-Pa
49-hp
30-Pa
62-hp
8-p€
47-hp
40-p€
196-pp
38-p€
69-14gpm
11-Gd
12-
6-Gd
12-hp
20-Gd
93-12gpm
35-p€
42-5gpm
17-p€
30-hp
38-Pa
55-pp
30-Pa
60-hp
48-p€
59-10gpm
19-Gd
70-pp
67-Gd
92-6gpm
-p€
159-hp
9-p€
39-hp
Spring
5-Gd
28-15gpm
22-Pa
61-hp
23-p€
36-8gpm
35-p€
94-40gpm
40-Pa
203-hp
18-Gd
85-
6-p€
57-3gpm
44-Pa
72-hp
3-Gd
68-hp
11-Gd
12-
70-Gd
133-15gpm
-p€
105-pp
54-Pa
128-300gpm
24-Pa
38-pp
38-p€
82-12gpm
Spring
Spring
13-Gd
50-hp
40-p€
138-pp
16-Pa
161-
61-p€
101-hp
34-
40-
39-p€
80-15gpm
13-Gd
78-pp
72-p€
240-pp
22-p€
72-pp
10-Pa
90-pp
64-Pa
96-pp
16-Pa
42-hp
Spring
24-Gd
30-hp
4-Gd
40-pp
Spring
- hp
14-p€
120-pp
33-
54-pp
18-p€



MICHIGAN
DEPARTMENT OF CONSERVATION
DICKINSON COUNTY

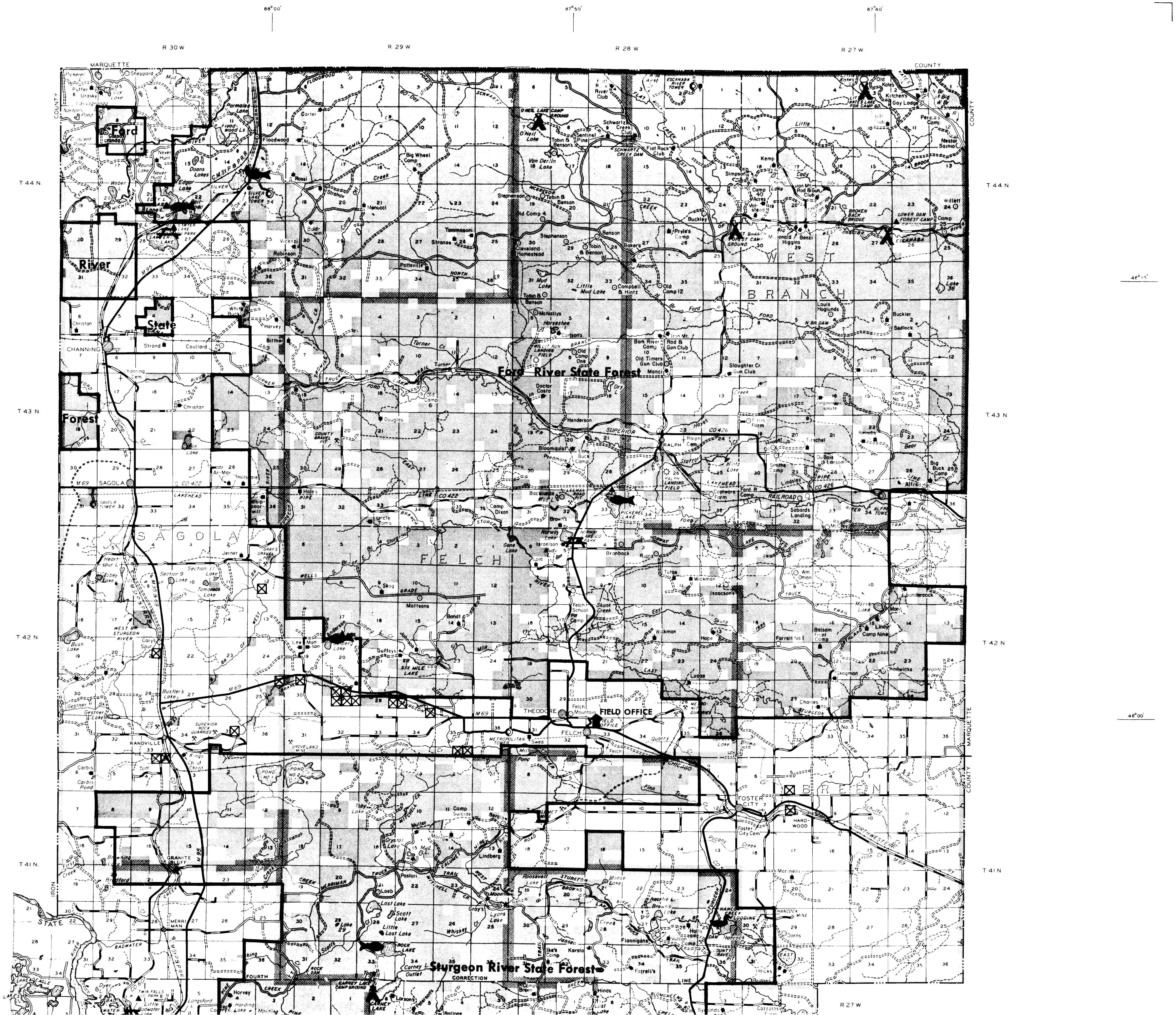
SCALE IN MILES
0 1 2
N

LEGEND

- DIVIDED ROADS
- INTERCHANGES
- GRADE SEPARATIONS
- PAVED ROADS
- GRAVELED ROADS
- GOOD DIRT ROADS
- POOR DIRT ROADS
- TRAILS
- FIRE BREAKS
- RAILROADS
- NARROW GAUGE RAILROADS
- UTILITY LINES (LABELED AS TO TYPE)
- ABANDONED RAILROADS
- LAKES
- INTERMITTENT LAKES
- RIVERS AND STREAMS
- INTERMITTENT STREAMS
- DRAINAGE DITCHES
- DAMS
- FALLS
- RAPIDS
- SPRINGS
- FLOWING WELLS
- AIDS TO NAVIGATION
- AIRPLANE LANDING FIELDS
- COUNTY SEATS
- TOWNS
- LODGES OR CAMPS
- PARKS, FISHING SITES, ETC
- LANDMARKS, FOUR CORNERS ETC.
- TOWN HALLS
- SCHOOLS
- CHURCHES
- CEMETERIES
- FOREST FIRE TOWERS
- TOWERMENS CABINS
- PATROL CABINS
- GOLF COURSES
- OBSERVATION TOWERS
- MINES, QUARRIES AND PITS
- SUMMITS OR PEAKS
- FORTS AND ARMY CAMPS
- BRIDGES
- FERRIES
- POLITICAL TOWNSHIP BOUNDARIES
- STATE LANDS DEDICATED FOR STATE FORESTS, PARKS AND OTHER PUBLIC CONSERVATION USES
- FEDERAL GOVERNMENT LANDS IN NATIONAL FORESTS
- BOUNDARIES, STATE AND NATIONAL PROJECTS
- CONSERVATION DEPARTMENT UNITS
- PUBLIC ACCESS SITES
- MUNICIPAL AND ROADSIDE PARKS
- STATE AND NATIONAL FOREST CAMP GROUNDS
- WILDLIFE FLOODING
- STATE HOLDS EASEMENT FOR PUBLIC FISHING ALONG STREAM BANKS OVER THE 40 ACRES INDICATED

NOTE:
IT IS THE POLICY TO RETAIN STATE LANDS IN STATE OR NATIONAL PROJECT AREAS. FOR FURTHER INFORMATION INQUIRE LANDS DIVISION, DEPARTMENT OF CONSERVATION, LANSING, MICHIGAN 48926

NOTE
LAND OWNERSHIP REVISED 8-1-1985
OVERLAY CORRECTED 8-1-1965
DICKINSON CO.
JUNE 1, 1961



88°10'
88°00'
87°50'
87°40'
R 30 W
R 29 W
R 28 W
R 27 W
MARQUETTE
COUNTY
T 44 N
T 43 N
T 42 N
T 41 N
46°10'
46°00'
IRON
MARQUETTE COUNTY
Ford River State Forest
Sturgeon River State Forest
FIELD OFFICE
WEST BRANCH
FELCH
SAGOLA
BREEN
CHANNING
SAGOLA
RANDVILLE
THEODORE
FELCH
RALPH
FOSTER CITY
HARDWOOD
GRANITE BLUFF
MERRIMAN
Floodwood
Pottsville
Almone
Turner
Henderson
Camp Dixon
Sagola Tower
Felch Mountain
O'Neil Lake Camp Ground
West Branch Forest Camp Ground
Lower Dam Forest Camp Ground
Little Kates Lake For Camp Gd.
Escanaba River Tower
Silver Lake Tower
Sawyer Lake Co Park
Norway Lake Co Park
Metropolitan Tower
Superior Rock Quarries
Groveland Mine
Hancock Mine
Hancock Creek Flooding
Carney Lake Camp Ground
Twin Falls CC Park
Six Mile Lake
Pickerel Lake
Rock Lake
Lost Lake
Scott Lake
Gene Lake
Solberg Lake
Bush Lake
Marsh Lake
Tobey Lake
Tamarack Lake
Gestner Lake
Pond No 1
Pond No 2
Crystal Lake
Moose Lake
Lyons Lake
Carbis Pond
Doans Lakes
Edgar Lake
Parmalee Lake
Van Derlin Lake
Mud Lake
Little Mud Lake
Lake 36
Fox Lake
Horseshoe L
Michigamme
Schwartz Creek Dam
Broken Back Bridge
N. Br. Dam
Rock Dam
County Gravel Pit
Ralph Landing Field
Willit Run Landing Field
C.M.St.P.&P.R.R.
Chicago Northwestern Ry
M 95
M 69
CO 422
CO 426
CO 581
CO 607
Lakehead Pipe Line
Escanaba
Ford
Sturgeon
West Br. Sturgeon River
Turner Cr
Twomile Creek
Skunk Creek
Hancock Cr.
Mitchell Cr.
Finn Town
Calumet Mine

Table 1.--Well Records

Explanation

Wells are identified according to their geographical township location, for example, "44N 30W 23-1 SE NE" refers to well #1 situated in the southeast quarter of the northeast quarter of section 23, of Township 44 North, Range 30 West. Altitudes are estimated from topographic maps.

Pc ..... Precambrian
Pa ..... Paleozoic
Gd ..... Glacial Drift

D ..... Domestic
S ..... Stock
P ..... Public supply

I ..... Industrial
O ..... Observation

Well Number	Location in section ¼	¼	Owner	Driller	Date drilled	Diameter	Depth	Aquifer	Use	Water level	Date	Altitude	Depth to bedrock	Remarks
44N 30W														
23-1	SE	NE	Joe Dault	Anderson	1962	6	87	Pc	D	64	1962	1430	---	
23-2	SW	NE	Joe Dault	Kleiman	1957	6	69	Pc	P	22	3-15-57	1420	60	
23-3	NE	NE	E. J. DeGaynor	Kleiman	1958	6	79	Pc	D	13	6- 2-58	1420	68	
28-1	SE	NE	Dick. Co. 4-H Club	Anderson	1951	6	185	Pc	P	110	8-13-51	1420	170	Well abandoned because of excessive silt. Cased to 170 feet.
33-1	NE	NE	Bert Buckland	Kleiman	1962	3	71	Gd	D	32	7-16-62	1400	---	Cased to 68 feet.
44N 28W														
10-1	SE	SW	Casper Uldriks	Kleiman	1962	3	59	Gd	D	36.27	7-30-64	1280	---	
27-1	SE	SW	Ceasar Aimone	Owner	1934	60	13	Gd	D	11.16	9- 9-64	1260	---	
44N 27W														
17-1	NW	SW	J. McGreger	Kleiman	1956	6	43	Gd	D	22	6- 9-56	1240	---	
43N 30W														
9-1	SW	NW	O. Peterson	Anderson	----	5	28	Gd	D	18	----	1420	---	
9-2	NW	SE	Lawrence Carey	Tuominen	1960	6	107	Pc	D	34	1960	1360	102	Cased to 102 feet.
11-1	NE	SW	Fred Janus	Kleiman	1963	6	68	Pc	D	41	6-13-63	1360	18	Cased to 20 feet.
29-1	NE	NE	F. Van Gilder	Anderson	1950	5	73	--	D	38	1950	1410	---	Cased to 66 feet.
29-2	SW	SE	Amos Dishaw	Glass	1934	6	69	Pc	D	38	9-24-63	1480	40	
29-3	SE	SE	Sagola Township	--------	1923	6	115	Gd	P	------	----	1440	---	Supplies 50 families.
30-1	SW	SE	E. Johnson	Chiocchi	----	5	196	Pc	D	40	----	1530	40	Cased to 40 feet.
34-1	NW	SW	Edgar Erickson	Kleiman	1960	5	93	Gd	D	20	7-27-60	1360	---	
43N 29W														
36-1	NE	NW	--------	--------	1963 (?)	1¼	12	Gd	D	5.87	8-13-64	1180	---	
43N 28W														
23-1	NW	SE	Paul Mariucci	Chiocchi	----	5	42	Pa	D	15	----	1190	22	Cased to 22 feet.
23-2	NE	SW	John Cominsky	Kleiman	1959	5	60	Pa	D	31.19	3-18-64	1190	40	
23-3	NW	SW	Gilbert J. Johnson	Owner	1963	1¼	28	Gd	D	4	11-11-63	1140	---	
23-4	SE	SW	Norman Karstem	Kleiman	1961	3	49	Pa	D	44.47	8-24-64	1220	41	Cased to 45 feet.
23-5	SW	SE	--------	--------	----	1¼	14	Gd	D	8.74	7-30-64	1200	---	Well abandoned.
27-1	SE	NW	Sam Eutizzi	Chiocchi	----	5	62	Pa	D	30	----	1185	---	Cased to 22 feet.
43N 27W														
28-1	SE	SE	Joseph Turini	Kleiman	1963	3	47	Pc	D	8	1963	1160	42	Cased to 42 feet.
42N 30W														
2-1	SE	SE	Ron Koller	Kleiman	1964	4	30	Pc	D	18	2- 4-64	1320	13	Cased to 16 feet.
4-1	NE	SW	Donald Johnson	Kleiman	1961	5	42	Pc	D	35	4-27-61	1420	20	Cased to 25 feet.
7-1	SE	SW	Don Dario	Kleiman	----	4	59	Pc	D	49	1963	1410	45	
11-1	SW	NW	Norman Mainville	Kleiman	1963	6	70	Gd	D	28	6-14-63	1340	---	
18-1	NW	SW	John R. Williams	Kleiman	1961	6	32	Gd	D	------	----	1400	---	
18-2	SE	NW	Frank Morrell	Chiocchi	----	5	159	Pc	D	------	----	1410	140	
18-3	NE	NW	Leo Hart	Kleiman	1964	4	92	Gd	D	67	3-12-64	1390	---	
24-1	NW	NE	Paul Richards	Kleiman	1959	5	39	Pc	D	9.31	10-16-64	1320	38	
26-1	SE	NE	Herbert Locarelli	Kleiman	1958	6	36	Pc	D	23	9-24-58	1260	20	
28-1	SE	SE	Elmer Schowalder	Chiocchi	----	5	203	Pa	D,S	40	----	1260	---	
32-1	NE	SE	Clayton Rush	Kleiman	1957	6	133	Gd	D	70	7-25-57	1260	---	
33-1	NE	SE	John Horwath	Chiocchi	----	5	105	Pc	P	------	----	1260	---	Cased to 40 feet.
33-2	NE	SE	Harry Horwath	Chiocchi	----	5	72	Pc	D	20	10-15-64	1260	---	Cased to 30 feet.
42N 29W														
22-1	NE	SE	August Zamboni	Owner	----	24	24	Gd	D	21	10-14-64	1120	---	Dug well.
22-2	NE	SE	Watson	--------	----	4	39	--	D	flows	10-14-64	1130	---	
22-3	NE	SE	Joe Lajennesse	Kleiman	----	4	28	Gd	D	5	10-15-63	1130	---	
26-1	SE	SE	Carlton Cook	Kleiman	1961	6	57	Pc	D	6	5-29-61	1220	45	
30-1	NW	SE	M. A. Hanna Co.	Layne NW	1957	12	85	Gd	O	20.05	11-18-64	1260	---	
31-1	NE	SE	M. A. Hanna Co.	Layne NW	1951	12	128	Pa	D?	54	4- 2-51	1360	15	Used as domestic supply in iron ore plant.
32-1	SE	NE	Roy Leonard	Kleiman	1958	6	38	Pa	D	23.67	3-19-64	1260	18	
32-2	NW	SW	M. A. Hanna Co.	Layne NW	1958	10	161	Pc	O	16.01	11-18-64	1320	10	
33-1	NW	SE	Einor Helander	T. Rice	1943	4	85	--	D	------	----	1240	---	Had unpleasant taste 1963.
34-1	SW	NE	Fabian Steinbrecker	Kleiman	1958	6	82	Pc	D	39	8-12-58	1240	18	
34-2	SE	SE	Ronald Bergstrom	Kleiman	1960	6	101	Pc	D	61	4-13-60	1160	52	
42N 28W														
5-1	SE	NW	Kenneth Sheldon	Kleiman	1956	6	55	Pa	D	38	9-22-56	1160	15	
5-2	NE	SE	Edward Lantz	Chiocchi	----	5	96	Pa	D	42	----	1200	---	Cased to 32 feet.
5-3	NE	NW	Oliver Jedvick	Chiocchi	----	5	205	Pc	D	52	----	1160	---	Cased to 175 feet.
5-4	NW	NE	--------	Owner	1964	1¼	22	Gd	D	7.06	9-11-64	1160	---	
5-5	NE	SE	Roy Lantz	Chiocchi	1964	6	60	Pa	D	30	10-23-64	1180	---	
20-1	NE	SW	Rudy Gustafson	Owner	1964	5	67	Gd	D	30	9-11-64	1140	---	Pumps fine silty sand.
29-1	NW	NE	Clark Lucas	Chiocchi	1964	5	94	Pc	D	35	9-11-64	1180	---	
35-1	SE	NE	Edwin Oman	Kleiman	1958	6	50	Gd	D	13	4-17-58	1120	---	

Table 1.--Well Records.--Continued

Well Number	Location in section ¼	¼	Owner	Driller	Date drilled	Diameter	Depth	Aquifer	Use	Water level	Date	Altitude	Depth to bedrock	Remarks
42N 27W														
20-1	NE	NW	Joe Trepanier	Chiocchi	----	5	60	Pa	D	21.92	9-14-64	1200	---	Cased to 25 feet.
26-1	SW	NW	J. B. Erickson	Kleiman	1956	6	68	Gd	D	4	10- 2-56	1100	---	
29-1	NW	SE	Sanford Olson	Chiocchi	----	5	72	Pa	D	44	----	1080	---	
32-1	SE	NW	Wm. Dawe	Chiocchi	----	5	76	Pa	D	50	----	1130	---	Cased to 32 feet.
32-2	SW	SW	S. J. Peterson	Chiocchi	----	5	138	Pc	D	40	----	1120	---	Cased to 40 feet.
33-1	NE	NW	E. W. LaFreniere	--------	----	36	12	Gd	O	11.19	3-17-64	1060	---	WMP obs. well #10.
41N 30W														
3-1	NE	SW	Duane Pollack	Kleiman	1960	6	78	Gd	D	13	8-24-60	1260	78	Gravel 70 to 77 feet.
4-1	NE	SW	E. J. Verrette	Kleiman	1958	6	80	Pc	D	39	3- 4-58	1300	75	Rock bluff 100' South.
16-1	NW	NE	Herman Bremer	Kleiman	1958	6	40	Gd	D	4	6-19-58	1200	---	Rock bluff 100' West.
17-1	NE	NE	Ellen Sjoquist	Kleiman	1958	6	30	Gd	D	24	7-31-58	1260	---	
25-1	NE	SW	Dick. Co. Rd. Comm.	WMP Co.	1948	1¼	20	Gd	O	dry	11-19-64	1220	---	Contains water in spring.
25-2	SE	NE	Oscar Martinson	Owner	----	48	12	Gd	O	11.42	12- 2-63	1200	---	WMP Co. obs. well.
25-3	SE	NE	Oscar Martinson	Anderson	1949	6	54	--	D	33	9-49	1200	---	
25-4	NW	SE	William Carollà	--------	----	6	60	--	D	------	----	1240	---	
25-5	SE	NW	Mel Martin	Kleiman	1955	6	120	Pc	D	14	7- 7-55	1260	63	
27-1	NW	SE	John Colombo	Kleiman	1958	6	104	Gd	D	------	----	1200	---	Pulled casing back to 51 ft.
27-2	SE	SW	Darwin Wilson	Chiocchi	----	5	49	Gd	D	30	----	1190	---	
28-1	SE	SE	Merriman Comm. Bldg.	Anderson	1957	6	70	--	P	37	1957	1170	---	Screen finish.
30-1	NE	NW	Maitland Dow	Anderson	----	6	63	--	D	15	----	1180	---	
32-1	SE	NE	Norm LaFarve	Kleiman	1964	7	150	Pc	D	18	5-20-64	1240	50	Cased to 54 feet.
34-1	SE	SW	Elerde Faius	Anderson	----	6	128	--	D	85	----	1270	---	Screen finish.
41N 28W														
1-1	SE	SE	Carl Johnson	Chiocchi	----	6	240	Pc	D	72	----	1160	---	Cased to 72 feet.
8-1	SE	SW	John L. Peterson	Chiocchi	1953	4	42	Pa	D	16	1953	1150	8	
12-1	SE	NE	Harry Peterson	C. Rice	1930	4½	197	Pa?	D	50	3- 3-61	1040	---	
34-1	NW	SW	Marlin & Griffee	Owners	1961	1¼	13	Gd	D	8.72	11-13-64	990	5	Pipe in fracture in bedrock.
41N 27W														
2-1	NE	NW	A. Francke	Anderson	----	6	40	Gd?	D	34	----	1180	---	
6-1	SE	SE	Allen Johnson	Chiocchi	----	5	105	--	D	8	----	1170	---	Cased to 88 feet.
7-1	NE	NE	Pat Milligan, Jr.	Chiocchi	1959	5	109	Pc	D	67	1959	1180	---	Cased to 67 feet.
7-2	SW	NW	Pat Milligan	Chiocchi	1963	5	72	Pc	D	22	1963	1060	---	Cased to 22 feet. Open finish.
7-3	NW	SE	Foster City Cemetery	T. Rice	1948	6	55	--	P	------	----	1060	---	
7-4	SW	SW	Reuben Skogman	Chiocchi	----	5	96	Pa	D	64	----	1150	---	On top of bluff. Cased to 10 feet.
9-1	SE	NW	Dale Sigler	Chiocchi	----	6	90	Pa	D	10	----	1040	---	Water contains 2.0 ppm iron.
40N 31W														
23-1	SE	SE	Pine Mt. Corp.	Rometti	1961	6	116	Pa	I	50.72	9- 5-61	1165	32	
23-2	SE	SE	Pine Mt. Corp.	Rometti	1961	6	150	Pa	I	------	----	1165	32	
23-3	SE	SE	Pine Mt. Corp.	Rometti	1961	6	125	Pa	I	------	----	1170	32+	Cased to 34 feet.
40N 30W														
5-1	SW	NW	John DeGrave	Anderson	1957	5	88	Gd?	D	67	1957	1200	---	
6-1	SE	SW	Joseph Giachino	Rometti	1963	6	31	Gd	D	10	1963	1200	---	Screen finish.
6-2	SE	SE	Joseph Langford	Kleiman	1958	6	82	Gd	D	------	----	1180	---	
8-1	SW	NW	Wes Fontenhio	Kleiman	1963	4	36	Gd	D	16	7-63	1120	---	
14-1	SE	SW	Dave Heidke	Anderson	1962	6	110	Pc ?	D	78	9-62	1100	110	
14-2	SW	SE	Wm. Haigh	Anderson	1964	6	110	--	D	72	1964	1100	---	Cased to 90 feet.
17-1	SE	NE	Immanuel Baptist Church	Kleiman	1962	3	19	Gd	P	6	6-16-62	1180	---	
18-1	SE	SW	Jerry Miksa	Kleiman	1959	6	78	Gd	D	17	6-13-59	1140	---	
18-2	SE	SW	H. B. Miller	Kleiman	1959	6	79	Gd	D	39	10-21-59	1140	---	
18-3	SE	SW	M. Tousignant	Kleiman	1956	6	64	Gd	D	29	----	1140	---	
18-4	NE	SW	F. Hermance	Kleiman	1958	6	71	Gd	P	34	10- 3-58	1160	---	
18-5	NE	SW	Otto Kelberg	Kleiman	1960	6	83	Gd	P	27	5-19-60	1180	---	
18-6	NW	NW	Charles Lindberg	Kleiman	1955	6	20	Gd	D	4	8-21-55	1160	---	
18-7	NE	NW	Erwin Smolinski	Kleiman	1960	6	41	Gd	D	4	11-28-60	1180	---	
19-1	NE	NW	Reuben Hamari	Kleiman	1959	6	81	Gd	D	35	9-26-59	1140	---	
19-2	NW	NE	Bacco Const. Co.	Kleiman	1958	6	48	Gd	D	21	7- 1-58	1160	---	
19-3	SE	NE	Esau Cohodes	Kleiman	1958	6	52	Gd	D	12	9-24-58	1140	---	
20-1	SE	NE	City of Iron Mountain	--------	----	2	---	--	P	Flows	9-17-64	1160	---	Flows 20 ft. above lake
21-1	SE	SW	Dickinson County	Kleiman	1957	6	30	Gd	D	4	11-15-57	1160		
23-1	NE	NE	John Pengrazi	Kleiman	1963	4½	60	Pc	D	14	11-63	1100	---	Cased to 29 feet.
23-2	NE	SE	Eugene Bronz	Kleiman	1962	6	107	Pa	D	5	4-62	1180	100	Cased to 102 feet.
24-1	NE	SW	John Fontecchio	Kleiman	1963	6	46	Gd	D	26	10- 1-63	1140	---	
27-1	NE	SW	Allan Carlson	Kleiman	1959	6	75	Gd	D	26	4-20-59	1150	---	Occasionally shows slight red color.
27-2	SW	NW	F. Pesavento	Kleiman	1959	6	65	Gd	D	36	4-16-59	1180	---	
27-3	SW	SW	Richard Waldbilig	Kleiman	1955	6	64	Gd	D	28	10-20-55	1180	---	
28-1	SW	NW	Jane Thekan	Kleiman	1962	6	49	Gd	D	5	4-26-62	1160	---	Water silty if pumped at more than 30 gpm.
31-1	SW	NW	Zacks Fruit Co.	Kleiman	1958	6	70	Gd	I	14	----	1140	---	
40N 29W														
6-1	SW	NW	Mich. Dept. Cons.	Kleiman	1964	4	30	Gd	-	17.97	9- 8-64	1120	27	Insufficient water to develop well. Casing pulled.
6-2	NW	SW	Mich. Dept. Cons.	Kleiman	1964	4	37	Gd	-	12.22	9-11-64	1120	37	Screen plugged with silt. Casing pulled.
28-1	NE	NW	George Branback	Kleiman	1962	3	30	Gd	D	19	9-11-62	1160	---	
28-2	SW	NE	Howard Hammill	Kleiman	1961	3	21	Pc	-	dry	10-30-61	1140	21	
29-1	SW	SW	Stanish Bal	Anderson	1961	6	52	Pc ?	S	2	1961	1100	---	Cased to 18 feet.
31-1	SW	SE	Joe Baciak	Anderson	1963	6	200	Pa	D	40	1963	1100	68	Cased to 68 feet.
40N 28W														
4-1	NE	SE	C. M. Huck	Anderson	----	5	52	Gd?	D	36	----	1000	---	
4-2	NW	SW	Anton Stockovitz	Anderson	----	6	80	Pc ?	D	35	----	990	---	Cased to 38 feet.
10-1	NE	SW	Clyde Randall	Chiocchi	----	5	96	Pc	D	32	----	980	---	Cased to 35 feet.
12-1	NW	NW	Wm. Asselin	Kleiman	1960	5	157	Gd	D	19	10-21-60	980	60	Cased to 60 feet. Casing dynamited at 41 ft. to provide additional supply.

Table 1.--Well Records.--Continued

Well Number	Location in section ¼	¼	Owner	Driller	Date drilled	Diameter	Depth	Aquifer	Use	Water level	Date	Altitude	Depth to bedrock	Remarks
40N 28W (Cont'd)														
26-1	NE	SE	H. Cousineau	Kleiman	1963	3	70	Gd	D	19	5-10-63	980	---	
35-1	SW	NE	Bernard Rossato	Kleiman	1961	3	57	Gd	D	46	7- 3-61	1000	---	
39N 31W														
12-1	NE	SE	Wis. Mich. Power Co.	Anderson	----	6	345	--	-	8	----	1100	---	Open finish
12-2	NE	SE	Wis. Mich. Power Co.	Anderson	----	8	72	--	-	45	----	1100	---	Screen finish
39N 30W														
1-1	SW	NW	Glenn Anderson	Anderson	----	6	100	Pc	D	16	----	1060	30	
1-2	SW	SW	Alfred Oelke	Chiocchi	----	5	327	Pc	-	75	----	1060	---	Cased to 73 feet.
2-1	NW	SW	Louis Chiocchi	Chiocchi	1963	6	228	Pc	D	40	1963	1040	37	Cased to 37 feet.
3-1	SE	NE	Breitung Township	--------	1942	20	125	Gd	P	------	----	1040	---	Gravel pack finish.
3-2	SE	NE	Breitung Township	Layne NW	1953	8	160	Gd	P	60	4-53	1040	---	Screen finish.
4-1	NW	NE	Guy Gustaffson	Anderson	1960	6	35	Pc	P	28	4-61	1050	---	
8-1		NW	Wis. Mich. Power Co.	Anderson	1959	6	92	Pa	D	55	----	1000	---	Screen finish.
13-1	Center		Kimberly-Clark Corp.	Kleiman	1956	6	140	Gd	O	132.75	10-28-64	1051	---	
13-2	NW	SW	Kimberly-Clark Corp.	Kleiman	1957	6	118	Gd	O	111.52	10-28-64	1041	---	
13-3	SW	NW	Kimberly-Clark Corp.	Kleiman	1956	6	50	Gd	O	dry	3- 7-56	1052	50	
13-4	NE	NW	Wallace Jones	Chiocchi	----	5	114	Gd	D	92	----	1040	---	
14-1	Center		Kimberly-Clark Corp.	Kleiman	1956	6	95	Gd	O	78.41	10-28-64	1025	95	Gravel packed screen finish.
14-2	Center		Kimberly-Clark Corp.	Kleiman	1957	6	30	Gd	O	12.68	10-28-64	960	---	Water level fluctuates with river.
39N 29W														
2-1	SW	NE	Wm. LaVoie	Anderson	1946	5	72	Gd	D	36	9-64	980	---	
5-1		SE	Americo Tinti	Anderson	1949	6	174	--	D	75	1949	1040	---	Cased to 68 ft. Open finish.
8-1	NE	SE	James Stewart	Kleiman	1958	6	112	Gd	I	56	6- 5-58	940	---	Water contains excessive ferric iron.
12-1	SW	SW	Stan Baciak	Chiocchi	----	6	168	Pa	D	40	1963	1040	---	Open finish.
14-1	NW	SW	Frances Girardi	Chiocchi	----	5	47	Gd	D	20	9-15-64	860	---	
14-2	SW	SW	R. Haferkorn	Owner	----	36	21	Gd	S	12	1964	850	---	
15-1	SE	SE	Joseph Haferkorn	Chiocchi	----	5	158	Gd	D	45	9-64	840	---	Slight taste.
17-1	SE	NE	Lewis Rector	Kleiman	1958	6	140	Pc	D	------	----	940	50	
20-1	NW	NE	Joe Palluch	Chiocchi	1961	6	40	Gd	D	15	----	----	---	
22-1	SW	SE	Mike Mannicor	Kleiman	1963	4	88	Gd	D	28	10-30-63	860	---	
25-1	NE	NE	Francis Sweig	Kleiman	1962	3	70	Gd	D	3	6-16-62	860	---	
26-1	NE	SE	Adam Ball	Chiocchi	1959	5	349	Pc	D	60	----	----	80	
27-1	NE	SE	City of Norway	Kleiman	1958	6	40	Gd	D	10	11-26-58	----	---	Supplies 3 houses.
36-1	SE	NE	Henry Varda	Kleiman	1963	7	101	Pc	D	42	10-63	----	100	
39N 28W														
7-1	SW	SW	Murriel Girard	Chiocchi	----	5	268	Pc	D	60	----	880	62	Cased to 62 feet.
7-2	SW	SW	Joe Drie	Kleiman	----	5	69	Gd	D	15	----	880	---	
8-1	SE	NE	Wis. Mich. Power Co.	Anderson	1962	6	87	Pc	P	21.06	9-15-64	900	37	
14-1	NW	NW	Paul Hupp	Anderson	1959	6	39	Gd	D	25	1959	970	---	Screen finish.
14-2	SW	SE	Robert Bunt	Glass	1962	6	167	Pc ?	D	90	6- 3-61	1060	87	
16-1	NW	NW	Steve Bubloni	Anderson	1963	6	150	Pc	D	72.57	9-15-64	1040	72	Cased to 100 feet.
16-2	SW	SE	Frank Habamer	Anderson	----	6	42	Gd	D	18	----	1060	---	
18-1	NW	NW	Kaspinski Tavern	Anderson	1961	6	72	Gd?	P	51	9-61	900	---	Cased to bottom.
19-1	SW	SW	Leonard Losito	Kleiman	1962	3	27	Pc	D	3	6-16-62	850	16	
19-2	SW	SW	Sue McCormick	Kleiman	1961	3	45	Pc	D	------	----	850	42	
19-3	NW	NW	Walter Breclaw	Chiocchi	----	5	275	Pc	D	76.42	5-14-64	860	---	Cased to 74 feet.
20-1	SW	SE	George DeRidder	Kleiman	1962	3	40	Gd	D	24	6-20-62	860	---	
20-2	SE	SE	Ed. Bouchey	Kleiman	1963	3	120	Gd	D	6	4-30-63	860	---	
21-1	NW	SW	Clifford Frenn	Chiocchi	----	5	196	Pc	D	85	----	----	---	Cased to 96 feet.
24-1	SW	SE	C. Linder	Le Beau	1963	5	100	Pa	D	77.28	9-15-64	1020	---	Open finish.
25-1	NW	NE	Richard Skog	Anderson	1948	6	88	--	D	61	1948	1000	---	Cased to 73 feet.
30-1	NW	NE	Frank Bray	Kleiman	1962	3	18	Gd	D	7	6-10-62	860	---	
30-2	NW	NE	Ernest Cosanova	Kleiman	1961	3	18	Gd	D	flow	6- 9-61	860	---	Flowed 0.5 ft. above land surface 6-9-61
30-3	SW	NE	Mary Johnson	Kleiman	1962	3	34	Pc	D	17	6- 7-62	860	23	Cased to 24 feet.
30-4	SW	NE	Lee Johnson	Kleiman	1962	3	27	Gd	D	flow	6- 2-62	840	---	Flowed 5 gpm 3 ft. above land surface 6-2-62
30-5	SE	NW	Harry Teafoe	Chiocchi	----	5	368	Pc	D	28	----	----	---	Cased to 35 feet.
30-6	SW	NW	Dickinson Co. Park	Chiocchi	----	5	91	Gd	P	47	----	----	---	
30-7	SW	NE	Carroll Asp	Chiocchi	----	5	58	Pc	D	22	----	----	---	Cased to 38 feet.
30-8	SE	NW	Carl Danelison	Chiocchi	1953	5	57	Pc	D	14	----	----	---	Cased to 20 feet.
32-1	SW	SW	Julius Van Wiele	Owner	1950	6	132	Gd	S	20	1950	----	132	Pulled casing back 0.5 ft. into gravel
35-1	NW	NW	Ed Magnuson	Le Beau	1947	6	120	Pa	D	55	1947	----	96	Cased to 96 feet.

TABLE 2.--DRILLERS' WELL LOGS

Explanation

Altitudes estimated from topographic maps.
Figures given are in feet.

	Thickness of unit	Bottom of unit
TOWNSHIP 44 NORTH; RANGE 30 WEST		
44N 30W 23-2 Joseph Dault SW¼ NE¼ Section 23 Altitude: 1420		
Sand	30	30
Hardpan	5	35
Some gravel mix	5	40
Lake sand	5	45
Clay	5	50
Hardpan	10	60
Slate	8	68
44N 30W 23-3 E. J. De Gaynor NE¼ NE¼ Section 23 Altitude: 1420		
Sand	10	10
Gravel, fine	10	20
Sand, rough	10	30
Sand, sharp	10	40
Hardpan	20	60
Gravel (water)	2	62
Hardpan	6	68
Slate (water)	11	79
44N 30W 28-1 Dickinson Co. 4-H Club SE¼ NE¼ Section 28 Altitude: 1420		
Pit	10	10
Sandy clay, fine (poor permeability)	60	70
Very fine quick sand	10	80
Clay, no sand	85	165
Fine sand, no water	1	166
Clay	4	170
Black quartzitic chips, some pyrite, not slate	15	185
44N 30W 33-1 Bert Buckland NE¼ NE¼ Section 33 Altitude: 1400		
Sandy clay	12	12
Clay	30	42
Clay and small rocks	12	54
Sandy loam (water)	1	55
Intermittent clay and sand	10	65
Watersand, coarse	6½	71½
TOWNSHIP 44 NORTH; RANGE 28 WEST		
44N 28W 10-1 Casper Uldriks SE¼ SW¼ Section 10 Altitude: 1280		
Sandy loam	5	5
Gravel and boulders	15	20
Sand	5	25
Pink clay	8	33
Clean fine sand	5	38
Dirty fine sand	17	55
Clean coarse watersand	4	59
TOWNSHIP 44 NORTH; RANGE 27 WEST		
44N 27W 17-1 James McGreger NW¼ SW¼ Section 17 Altitude: 1240		
Rough gravel	20	20
Hardpan	11	31
Clay and boulders	10	41
Hard cemented gravel	2	43
TOWNSHIP 43 NORTH; RANGE 30 WEST		
43N 30W 11-1 Fred Janus NE¼ SW¼ Section 11 Altitude: 1360		
Sand	18	18
Red hematite	50	68
43N 30W 29-2 Amos Dishaw SW¼ SE¼ Section 29 Altitude: 1480		
Red clay	40	40
Hematite	29	69
43N 30W 34-1 Edgar Erickson NW¼ SW¼ Section 34 Altitude: 1360		
Sandy loam	15	15
Limestone rock	3	18
Hardpan	30	48
Pea gravel with water	2	50
Sandstone boulder	2	52
Hardpan with water	8	60
Sand with brown clay seams	10	70
Hardpan	10	80
Sand with brown clay	7	87
Pea gravel	6	93
TOWNSHIP 43 NORTH; RANGE 28 WEST		
43N 28W 23-2 John Cominsky NE¼ SW¼ Section 23 Altitude: 1190		
Topsoil and gravel	5	5
Gravel	10	15
Hardpan	10	25
Hardpan, some water	10	35
Hardpan	5	40
Sandstone	20	60
43N 28W 23-4 Norman Karsten SE¼ SW¼ Section 23 Altitude: 1220		
Sandy loam	5	5
Hardpan	5	10
Limestone boulder	12	22
Pink clay hardpan	19	41
Yellow sandstone	4	45
Blue sandstone	5	50
TOWNSHIP 43 NORTH; RANGE 27 WEST		
43N 27W 28-1 Joseph Turini SE¼ SE¼ Section 28 Altitude: 1160		
Sandy loam	2	2
Hardpan and boulders	38	40
Coarse sand, water	2	42
Ledge	5	47
TOWNSHIP 42 NORTH; RANGE 30 WEST		
42N 30W 2-1 G. R. Rumpf SE¼ SE¼ Section 2 Altitude: 1320		
Topsoil	2½	2½
Red clay, boulders	11	13½
Schist, mica, decomposed	4½	18
Schist, weathered	2½	20½
Blue hematite	10	30½
42N 30W 4-1 Donald T. Johnson NE¼ SW¼ Section 4 Altitude: 1420		
Sandy loam	15	15
Hardpan and gravel	5	20
Sandstone	5	25
Green limestone and Randville dolomite	17	42
42N 30W 7-1 Don Dario SE¼ SW¼ Section 7 Altitude: 1410		
Topsoil	13	13
Gravel, hardpan	17	30
Limestone floater	5	35
Red clay	10	45
Slate hematite	14	59
42N 30W 11-1 Norm Mainville SW¼ NW¼ Section 11 Altitude: 1340		
Fine sand	5	5
Sharp sand	20	25
Clay and sand	15	40
Sand and water	10	50
Black silt	15	65
Red clay	5	70
42N 30W 18-1 John R. Williams NW¼ SW¼ Section 18 Altitude: 1400		
Hardpan and boulders	17	17
Clayey sand, a little water	8	25
Hardpan	4	29
Gravel, water	2' 9"	31' 9"
Ledge (?)		
42N 30W 18-3 Leo Hart NE¼ NW¼ Section 18 Altitude: 1400		
Red clay, boulders	20	20
Gravel and sand	4	24
Hardpan	6	30
Clayey sand	20	50
Clayey sand (redder)	12	62
Hardpan, some rock	10	72
Clayey sand	15	87
Clean, medium coarse sand	5	92
42N 30W 24-1 Paul Richards NW¼ NE¼ Section 24 Altitude: 1320		
Topsoil and boulders	5	5
Boulders, dynamited	3	8
Gravel	9	17
Hardpan	13	30
Large hard rock	3	33
Gravel and hardpan	5	38
Granite	1' 5"	39' 5"
42N 30W 26-1 Herbert Locarelli SE¼ NE¼ Section 26 Altitude: 1260		
Sandy loam	10	10
Hardpan	5	15
Blue clay	5	20
Inadequate water @ 20		
Sandstone and conglomerate	12	32
Slate	4	36

TABLE 2.--DRILLERS' WELL LOGS.--Continued

	Thickness of unit	Bottom of unit
42N 30W 32-1		
Clayton Rush		
NE¼ SE¼ Section 32		
Altitude: 1260		
Sand	25	25
Clay	5	30
Clay and sand	10	40
Clay and fine sand	40	80
Red sticky clay	6	86
Hardpan	38	124
Silt, very fine sand	2	126
Gravel and sand	2	128
Gravel	5	133
TOWNSHIP 42 NORTH;		
RANGE 29 WEST		
42N 29W 22-3		
Joe Lajennesse		
NE¼ SE¼ Section 22		
Altitude: 1130		
Black clay	23½	23½
Red clay	1	24½
Coarse sand	4	28½
42N 29W 26-1		
Carlton Cook		
SE¼ SE¼ Section 26		
Altitude: 1220		
Soapstone and clay	45	45
Some sandstone	5	50
Granite, some water	2	52
Granite and water	5	57
42N 29W 30-1		
M. A. Hanna Co.		
NW¼ SE¼ Section 30		
Altitude: 1260		
Dirt and gravel	5	5
Semi-hardpan	10	15
Sand and gravel	20	35
Fine sand and gravel	5	40
Sand and fine gravel	5	45
Coarse sand	5	50
Sand	5	55
Fine clayey sand	10	65
Fine sandy clay	10	75
Clay	10	85
42N 29W 31-1		
M. A. Hanna Co.		
NE¼ SE¼ Section 31		
Altitude: 1340		
Overburden	15	15
Sandstone	113	128
42N 29W 32-1		
Roy Leonard		
SE¼ NE¼ Section 32		
Altitude: 1260		
Surface clay	10	10
Hardpan	4	14
Big rock (dynamited)	1	15
Gravel	3	18
Red sandstone	20	38
42N 29W 32-2		
M. A. Hanna Co.		
NW¼ SW¼ Section 32		
Altitude: 1320		
Clayey sand	10	10
Sandstone, light brown to reddish brown or buff	149	159
Schist, oxidized and quartz	12	161
42N 29W 34-1		
Fabian Steinbrecker		
SW¼ NE¼ Section 34		
Altitude: 1240		
Clay loam	5	5
Clay loam, hardpan	10	15
Sand	3	18
White sandstone	7	25
White sandstone; red water	25	50
Iron ore, water	28	78
Brown ochre ore; water	4	82
42N 29W 34-2		
Ronald Bergstrom		
SE¼ SE¼ Section 34		
Altitude: 1160		
Clay soil	12	12
Gravel	8	20
Hardpan	20	40
Boulder	2	42
Hardpan	10	52
Iron ore	50	102
TOWNSHIP 42 NORTH;		
RANGE 28 WEST		
42N 28W 5-1		
Kenneth Sheldon		
SE¼ NW¼ Section 5		
Altitude: 1160		
Clay loam	5	5
Gravel	5	10
Hardpan	5	15
Sandstone	40	55
42N 28W 35-1		
Edwin Oman		
SE¼ NE¼ Section 35		
Altitude: 1120		
Topsoil	10	10
Hardpan	30	40
Hardpan, some water	5	45
Hardpan, water	5	50
TOWNSHIP 42 NORTH;		
RANGE 27 WEST		
42N 27W 26-1		
Paul Rahm		
SW¼ NW¼ Section 26		
Altitude: 1100		
Clay loam	5	5
Gravel	5	10
Hardpan	25	35
Clay	5	40
Hardpan	25	65
Gravel	2	67
TOWNSHIP 41 NORTH;		
RANGE 30 WEST		
41N 30W 3-1		
Duane Pollock		
NE¼ SW¼ Section 3		
Altitude: 1260		
Topsoil	5	5
Dry hardpan, large boulders	45	50
Wet hardpan	10	60
Hardpan and gravel	10	70
Gravel with water	7	77
Granite ledge	2	79
41N 30W 4-1		
E. J. Verrette		
NE¼ SW¼ Section 4		
Altitude: 1310		
Clay loam	5	5
Gravel	15	20
Clay	10	30
Clay, some water	10	40
Hardpan, gravel	10	50
Sand and clay	5	55
Gravel, clay mix	10	65
Gravel	5	70
Iron ore	2	72
Cemented gravel	3	75
Slate	5	80
41N 30W 16-1		
Herman Bremer		
NW¼ NE¼ Section 16		
Altitude: 1200		
Sand	20	20
Silt and sand	5	25
Sand	15	40
41N 30W 17-1		
Ellen Sjoquist		
NE¼ NE¼ Section 17		
Altitude: 1260		
Sand	5	5
Gravel	10	15
Hardpan	15	30
41N 30W 25-5		
Mel Martin		
SE¼ NW¼ Section 25		
Altitude: 1260		
Clay	27	27
Gravel	6	33
Hardpan	10	43
Blue clay and dyke	20	63
Iron ore	30	93
Quartz	1	94
Slate	9	103
Dyke	16	119
Granite	1	120
41N 30W 27-1		
John Colombo		
NW¼ SE¼ Section 27		
Altitude: 1200		
Gravel	0	30
Sand and clay	20	50
Gravel	3	53
Drilled to 104 ft., sand silt water mix. Pulled casing back to 51 ft.		
41N 30W 32-1		
Norm La Farve		
SE¼ NE¼ Section 32		
Altitude: 1240		
Hardpan and boulders	50	50
Water level at 16 ft.		
Badwater Greenstone	73	123
Quartzite (water on contact)	1	124
Water level at 13 ft.		
Greenstone and intermittant seams of quartz, white and pink	26	150
TOWNSHIP 40 NORTH;		
RANGE 31 WEST		
40N 31W 23-1		
Pine Mountain Corp.		
SE¼ SE¼ Section 23		
Altitude: 1165		
Glacial drift	32	32
Cambrian sandstone, tan, fine grained	28	60
Lens of sandstone, white crystalline encountered	10	70
Well finished in sandstone, tan, fine grained	46	116
40N 31W 23-2		
Pine Mountain Corp.		
SE¼ SE¼ Section 23		
Altitude: 1165		
Glacial drift	32	32
Cambrian sandstone, tan fine grained	28	60
Lens of sandstone, white crystalline encountered	10	70
Well finished in sandstone, tan, fine grained	80	150

TABLE 2.--DRILLERS' WELL LOGS.--Continued

	Thickness of unit	Bottom of unit
40N 31W 23-3		
Pine Mountain Corp.		
SE¼ SE¼ Section 23		
Altitude: 1170		
Glacial drift	32	32
Cambrian sandstone, tan fine grained	28	60
Lens of sandstone, white crystalline encountered	10	70
Well finished in sandstone, tan, fine grained	55	125
TOWNSHIP 40 NORTH; RANGE 30 WEST		
40N 30W 6-2		
Joseph Langsford		
SE¼ SE¼ Section 6		
Altitude: 1180		
Rough gravel	15	15
Gravel	5	20
Sand	10	30
Sand, some water	15	45
Sand	10	55
Clay	10	65
Fine sand	5	70
Sand	8	78
Gravel, water	4	82
40N 30W 8-1		
W. Fontenlio		
SW¼ NW¼ Section 8		
Altitude: 1120		
Clay and boulders	20	20
Gravel	6	26
Clay and sand	3	29
Fine sand	4	33
Mica sand	3	36
40N 30W 17-1		
Immanuel Baptist Church		
SE¼ NE¼ Section 17		
Altitude: 1180		
Topsoil	2	2
Hardpan	16	18
Gravel	½	18½
40N 30W 18-1		
Jerry Miksa		
SE¼ SW¼ Section 18		
Altitude: 1140		
Gravel	19	19
Boulder	1	20
Sand	5	25
Sand and clay	10	35
Hardpan and boulders slow water seepage	27	62
Gravel and clay	8	70
Gravel and clay mix some water	5	75
Hardpan	2	77
Gravel-water vein	1	78
Abundant water		
40N 30W 18-2		
H. B. Miller		
SE¼ SW¼ Section 18		
Altitude: 1140		
Topsoil and gravel	10	10
Sharp sand	5	15
Clay, gravel mix	5	20
Hardpan	10	30
Red hardpan	5	35
Hardpan	15	50
Sand and water mix	5	55
Red hardpan	15	70
Sharp sand and water	8	78
40N 30W 18-3		
Melvin Tousignant		
SE¼ SW¼ Section 18		
Altitude: 1140		
Clay and boulders	4	4
Gravel	42	46
Clay	8	54
Coarse sand	10	64
40N 30W 18-5		
Otto Kelberg		
NE¼ SW¼ Section 18		
Altitude: 1180		
Topsoil	5	5
Gravel and hardpan	9	14
Hardpan	41	55
Hardpan and gravel	10	65
Hardpan	5	70
Gravel	13	83
40N 30W 18-6		
Charles Lindberg		
NW¼ NW¼ Section 18		
Altitude: 1160		
Gravel and hardpan	7	7
Rock	5	12
Gravel and clay	8	20
40N 30W 18-7		
Erwin Smolinski		
NE¼ NW¼ Section 18		
Altitude: 1180		
Gravel and hardpan	15	15
Water-bearing gravel	5	20
Hardpan and gravel seams	21	41
Water-bearing gravel	½	41½
40N 30W 19-1		
Reuben Hamari		
NE¼ NW¼ Section 19		
Altitude: 1140		
Topsoil, gravel	10	10
Gravel, clay	10	20
Red hardpan	10	30
Gray hardpan and sand	10	40
Fine sand, silt	10	50
Fine sand	5	55
Clay	5	60
Gray clay	10	70
Gravel, clay mix	8	78
Clean gravel, water	3	81
40N 30W 19-2		
Sacco Construction Co.		
NW¼ NE¼ Section 19		
Altitude: 1160		
Gravel	10	10
Hardpan, some gravel	10	20
Gravel	5	25
Hardpan	5	30
Red hardpan	5	35
Gravel	5	40
Fine gravel	8	48
40N 30W 19-3		
Esau Cohodes		
SE¼ NE¼ Section 19		
Altitude: 1140		
Gravel	15	15
Sand, some water	5	20
Fine sand	20	40
Hardpan	5	45
Gravel	3	48
Hardpan	1	49
Gravel, water	3	52
40N 30W 21-1		
Dickinson County Park		
SE¼ SW¼ Section 21		
Altitude: 1160		
Clay loam	5	5
Sand	20	25
Hardpan	4	29
Gravel, water	1	30
40N 30W 23-2		
Eugene Bronz		
NE¼ SE¼ Section 23		
Altitude: 1180		
Hardpan and boulders	100	100
Sandstone, white	7	107
40N 30W 24-1		
John Fontecchio		
NE¼ SW¼ Section 24		
Altitude: 1140		
Topsoil	10	10
Gravel	20	30
Hardpan	7' 9"	37' 9"
40N 30W 27-1		
Allan Carlson		
NE¼ SW¼ Section 27		
Altitude: 1150		
Gravel	42	42
Hardpan	18	60
Sand, gravel	5	65
Gravel, hardpan	10	75
40N 30W 27-2		
Ferdinand Pesavento		
SW¼ NW¼ Section 27		
Altitude: 1180		
Topsoil	10	10
Sand and boulders	10	20
Hardpan	15	35
Hardpan and sand	5	40
Sand, some water	5	45
Hardpan, sand	5	50
Gravel, water	15	65
40N 30W 27-3		
Richard Waldbilig		
SW¼ SW¼ Section 27		
Altitude: 1180		
Clay loam	24	24
Rock ledge	9	33
Gravel	6	39
Clay loam, rock	15	54
Hardpan	9	63
Gravel	1½	64½
40N 30W 28-1		
Jane Thekan		
SW¼ NW¼ Section 28		
Altitude: 1160		
Topsoil	3	3
Red hardpan and boulders	43	46
Sand, gravel and water	2	48
Silt	2	50
40N 30W 31-1		
Zachs Fruit Company NW¼ Section 31		
Altitude: 1140		
Fill, gravel	5	5
Gravel	15	20
Slate and gravel	5	25
Fine gravel	5	30
Red iron ore, clay, gravel	10	40
Hardpan and gravel	20	60
Hardpan, red iron ore, clay	5	65
Water-bearing gravel	5	70
TOWNSHIP 40 NORTH; RANGE 29 WEST		
40N 29W 6-1		
Mich. Dept. of Conservation		
NW¼ NW¼ Section 6		
Altitude: 1120		
Topsoil	3	3
Gravel	7	10
Clay	10	20
Hardpan	5	25
Hardpan (ledge)	3	28
Insufficient water to develop well		
40N 29W 6-2		
Mich. Dept. of Conservation		
NW¼ SW¼ Section 6		
Altitude: 1120		
Fill	5	5
Silt, clay, fine sand	5	10

TABLE 2.--DRILLERS' WELL LOGS.--Continued

	Thickness of unit	Bottom of unit
40N 29W 6-2		
Continued		
Silt, clay with coarse gravel	5	15
Silt, clay, fine sand	5	20
Clay, buff, silty	5	25
Clay, buff, silty, trace of very fine sand	10	35
Sand, very fine, silty, trace of fine gravel	at	35
Gravel, pea sized	1	36
Sand very fine, silty and coarse gravel	½	36½
Clay, buff, silty	½	37
Gneiss	at	37
40N 29W 28-1		
George Branback		
NE¼ NW¼ Section 28		
Altitude: 1160		
Soil	12	12
Hardpan and boulders	17	29
Gravel	1	30
40N 29W 28-2		
Howard Hammill		
SW¼ NE¼ Section 28		
Altitude: 1140		
Clay and boulders	15	15
Hardpan, boulders, sand	6	21
Ledge at		21
Dry hole		
40N 29W 31-1		
Joe Baciak		
SW¼ SE¼ Section 31		
Altitude:		
Hardpan	68	68
Sandstone	50	118
Limestone	4	122
Sandstone	14	136
Sandstone, red	50	186
Red rock	12	198
TOWNSHIP 40 NORTH; RANGE 28 WEST		
40N 28W 12-1		
William Asselin		
NW¼ NW¼ Section 12		
Altitude: 980		
Humus, clay, boulders	5	5
Hardpan, red; boulders	15	20
Hardpan, red	20	40
Gravel	½	40½
Hardpan, dark	4½	45
Paint rock, gray (soft)	15	60
Paint rock, gray (hard)	5	65
Intermittant strata hard to soft	45	110
Paint rock, various colors		
Slate, soft	20	130
Slate, hard	15	145
Intermittant hard and soft slate strata	5	150
Granite ledge, very hard	7	157
40N 28W 26-1		
Hector Cousineau		
NE¼ SE¼ Section 26		
Altitude: 980		
Red clay	40	40
Pink clay and gravel	26	66
Fine clayey sand and water	4	70
40N 28W 35-1		
Bernard Rossato		
SW¼ NE¼ Section 35		
Altitude: 1000		
Old well pit	38	38
Pink clay and boulders	10	48
Sand and water	½	48½
Wet pink clay	8½	57
Sand and gravel, water	½	57½
TOWNSHIP 39 NORTH; RANGE 30 WEST		
39N 30W 3-2		
Breitung Township		
SE¼ NE¼ Section 3		
Altitude: 1040		
Gravel, sand	0	95
Fine tight sand with streaks of clay	25	120
Fine, tan, muddy sand	20	140
Medium tan sand	20	160
39N 30W 13-1		
Kimberly-Clark Corp.		
Center of Section 13		
Altitude: 1051		
Clay, brown, sandy	10	10
Gravel, medium, sandy clayey	10	20
Gravel, fine; loose sand	10	30
Sand, very fine to fine	20	50
Sand, medium to fine	10	60
Sand, very fine to coarse	10	70
Sand, very fine to medium	10	80
Sand, fine to coarse	10	90
Sand, very fine, silty	10	100
Clay, silty	10	110
No sample	10	120
Gravel, fine to medium with fine sand	20	140
39N 30W 13-2		
Kimberly-Clark Corp.		
NW¼ SW¼ Section 13		
Altitude: 1041		
Sandy loam	5	5
Gravel, clay mix	5	10
Gravel	5	15
Sand	10	25
Fine sand and clay	15	40
Clay	5	45
Clay and fine sand	5	50
Gravel and clay mix	5	55
Gravel	15	70
Sharp sand	20	90
Red packed sand	5	95
Sand	23	118
39N 30W 13-3		
Kimberly-Clark Corp.		
SW¼ NW¼ Section 13		
Altitude: 1052		
Sand, fine to coarse, very silty, some fine gravel	10	10
Sand, fine to coarse, fairly clean	10	20
Clay, gravelly, gray	10	30
Sand, fine to coarse	20	50
Ledge		
39N 30W 14-1		
Kimberly-Clark Corp.		
Center East ½ Section 14		
Altitude: 1025		
Sand, fine, silty	30	30
Clay, silty and sandy	20	50
Sand, very fine, silty	40	90
39N 30W 14-2		
Kimberly-Clark Corp.		
Center Section 14		
Altitude: 960		
Sand, fine, silty	20	20
Gravel, medium to coarse clean	10	30
TOWNSHIP 39 NORTH; RANGE 29 WEST		
39N 29W 8-1		
James Stewart		
NE¼ SE¼ Section 8		
Altitude: 940		
Sand	15	15
Sharp red sand	20	35
Beach sand	77	112
39N 29W 17-1		
Lewis Rector		
SE¼ NE¼ Section 17		
Altitude: 940		
Sand	30	30
Clay	5	35
Hardpan, water	15	50
Rock, ledge	8	58
Slate	12	70
Slate ore	10	80
Red slate ore	10	90
Black slate	10	100
Red slate	20	120
Black slate	5	125
Red slate	10	135
Slate	5	140
39N 29W 22-1		
M. Mannicor		
SW¼ SE¼ Section 22		
Altitude: 860		
Topsoil	5	5
Clay and sand	8	13
Clay	5	18
Sand	6	24
Red clay, and sand	3	27
Red clay	18	45
Clay and sand	10	55
Sand	2	57
Red clay and sand	15	72
Sand	16	88
39N 29W 25-1		
Francis Sweig		
NE¼ NE¼ Section 25		
Altitude: 860		
Sand and clay	15	15
Sand and clay and water	50	65
Medium coarse sand and water	5	70
39N 29W 26-1		
Adam Ball		
NE¼ SE¼ Section 26		
Altitude:		
Red clay	60	60
Gravel	20	80
Slate hematite	269	349
39N 29W 27-1		
City of Norway		
NE¼ SE¼ Section 27		
Altitude:		
Sandy loam	10	10
Sand	10	20
Hardpan	15	35
Gravel	5	40
39N 29W 36-1		
Henry Varda		
SE¼ NE¼ Section 36		
Altitude:		
Clayey sand	86	86
Hardpan	14	100
Pea gravel, broken hematite	1	101
TOWNSHIP 39 NORTH; RANGE 28 WEST		
39N 28W 7-1		
Murriel Girard		
SW¼ SW¼ Section 7		
Altitude: 900		
Glacial drift	62	62
Dolomite	206	268
39N 28W 7-2		
Joe Drie		
SW¼ SW¼ Section 7		
Altitude: 880		
Clay	30	30
Sand and gravel	39	69

TABLE 2.--DRILLERS' WELL LOGS.--Continued

	Thickness of unit	Bottom of unit
39N 28W 14-2		
Robert Bunt		
SW¼ SE¼ Section 14		
Altitude: 1080		
Clay and boulders	80	80
Ledge	87	167
39N 28W 19-1		
Leonard Losito		
SW¼ SW¼ Section 19		
Altitude: 850		
Humus	5	5
Gravel hardpan	11	16
Slate hematite	11	27
39N 28W 19-2		
Sue McCormick		
SW¼ SW¼ Section 19		
Altitude: 850		
Sandy loam	5	5
Hardpan, boulders	5	10
Pink hardpan	8	18
Clayey sand, water, could not be screened	4	22
Sand, hardpan	12	34
Gravel, hardpan, little water	8	42
Slate, iron ore, water	3	45
39N 28W 20-2		
Ed Bouchey		
SE¼ SE¼ Section 20		
Altitude: 860		
Humus	2	2
Gravel	7	9
Pink clay	14	23
Clayey sand, water	3	26
White clay	90	116
Coarse sand, water	5	121
39N 28W 30-1		
Frank Bray		
NW¼ NE¼ Section 30		
Altitude: 850		
Humus	5	5
Pink clay	12	17
Coarse gravel	1	18
39N 28W 30-2		
Mrs. Ernest Casanova		
NW¼ NE¼ Section 30		
Altitude: 840		
Sandy loam	5	5
Pink clay	10	15
Coarse sand and water	5	20
39N 28W 30-3		
Mary Johnson		
SW¼ NE¼ Section 30		
Altitude: 860		
Humus	5	5
Gravel	15	20
Hardpan	3	23
Schist ledge	11	34
39N 28W 30-4		
Lee Johnson		
SW¼ NE¼ Section 30		
Altitude: 840		
Humus	3	3
Sand	7	10
Hardpan	13	23
Medium coarse sand	4	27
39N 28W 32-1		
Julius Van Wiele		
SW¼ SW¼ Section 32		
Altitude: 985		
Clay	131	131
Gravel, clean	1	132
Hit granite at 132		
39N 28W 35-1		
Ed Magnuson		
NW¼ NW¼ Section 35		
Altitude:		
Glacial drift	96	96
Sandstone	24	120